Medha M. Pathak, Ph.D.

Associate Professor,
Dept. of Physiology & Biophysics,
Dept. of Biomedical Engineering,
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EDUCATION

University of California, Berkeley - Berkeley, California — May 2006
Ph.D., Biophysics

National Centre for Biological Sciences - Bangalore, India — December 2000
M.Sc., Life Sciences (Neuroscience)

St. Xavier's College - Ahmedabad, India — July 1996
B.Sc. Biochemistry & Chemistry

RESEARCH POSITIONS

University of California, Irvine - Irvine, California
Associate Professor, Department of Physiology & Biophysics — June 2023 – Present
Joint appointment in the Department of Biomedical Engineering — April 2019 – Present

- Research area: Mechanical forces in development and repair at the molecular, cellular and organismal level

University of California, Irvine - Irvine, California
Assistant Professor, Department of Physiology & Biophysics — June 2016 – June 2023

- Research area: Mechanical forces in development and repair at the molecular, cellular and organismal level

University of California, Irvine - Irvine, California — April 2015 – May 2016
Assistant Researcher

- Research area: Piezo1 in human neural stem cell mechano-regulation

University of California, Irvine - Irvine, California — January 2011 – March 2015
Associate Specialist

- Advisors: Francesco Tombola and Lisa Flanagan
- Project: Physiology and biophysics of mechanically-gated and voltage-gated ion channels

Harvard Medical School - Boston, Massachusetts — December 2006 – December 2010
Postdoctoral Fellow

- Advisor: David P. Corey.
- Project: Mapping components of the inner ear hair cell transduction machinery

University of California, Berkeley - Berkeley, California
Postdoctoral Fellow — June 2006 – September 2006
Graduate student — August 2000 – May 2006

- Advisor: Ehud Y. Isacoff
- Thesis: Watching an ion channel at work: fluorescence measurements of ion channel dynamics

National Centre for Biological Sciences - Bangalore, India — August 1996 – July 2000

- Advisor: Upinder S. Bhalla
- Master's thesis: Development of a fiber-optic technique for fluorescence recordings

Madurai Kamraj University - Madurai, India May – June 1996

- Advisor: K. Veluthambi
- Summer research project: Restriction mapping and subcloning of DNA B of Vigna mungo yellow mosaic virus

St. Xavier's College, Ahmedabad, India June 1995 – May 1996

- Advisor: Fr. Vincent J. Braganza
- Undergraduate research project: Protoplast fusion and somatic embryogenesis of rice

HONORS

2022 Early Investigator Award, Mechanobiology Subgroup, Biophysical Society 2022

Honorable Mention, 2022 Outstanding Early-Career Faculty Research Award (Basic Science), UCI School of Medicine 2022

Women's Leadership Academy, UCI School of Medicine 2021-2022

HHMI Gilliam Fellowship for Advanced Study, Howard Hughes Medical Institute 2019

UCI Chancellor's Award for Excellence in Undergraduate Research Mentoring 2018

ADVANCE Faculty Career Development Award, UCI 2018

Junior Faculty Networking Cohort, Journal of General Physiology 2017

Outstanding Paper of the year for Pathak *et al.* J.Gen.Physiol. 2016

- Cranefield award to senior author, Francesco Tombola

GSK Neuroscience Discovery Award, FASEB Ion Channel Regulation Conference 2015

Travel award: Force-Gated Ion Channels, Janelia Farms Research Campus 2015

The "Cahalan Buck" Research Accomplishments Award, UCI Dept. of Physiology & Biophysics 2014

Helen Hay Whitney Postdoctoral Fellowship 2008-2011

Travel award: Force-Gated Ion Channels, Janelia Farms Research Campus 2008

Travel award: Young Investigator Meeting, Poovar, India 2009

Travel award: Biology of the Inner Ear, MBL, Woods Hole, Massachusetts 2007

Travel award: Gordon Conference on Mechanotransduction & Gravity Signaling 2005

Junior Research Fellowship, National Centre for Biological Sciences, Bangalore, India 1996-2000

- 4 of 6000 applicants chosen

National Summer Research Fellowship, JNCASR, India 1996

Siddharth Bhatt Prize: all-round performance, St. Xavier's College, Ahmedabad, India 1996

LUMC Clinical Laboratories Research Fellowship, St. Xavier's College, Ahmedabad, India 1995–1996

FUNDING

Active

NIH R01 (1R01NS109810), in no-cost extension 9/30/2018 – 6/30/2024
Piezo1 in neural stem cell mechano-regulation $223,598 annual direct costs
Role: Principal Investigator

Administrative Supplement (R01NS109810-03S1) to NIH R01 grant 7/1/2020 – 6/30/2024
Administrative supplement explores the role of Piezo1 in Alzheimer's Disease pathology. $250,000 total direct costs
Role: Principal Investigator

NSF Conference grant 7/1/2018 – 6/30/2024
MechBio 2018: The Mechanome in Action. $37,663 total direct costs
Role: Principal Investigator

SCRC Hyperion Seed Grant 05/01/2022 – 04/31/2024
$25,000 total direct costs

Phenotyping of Piezo1-knockout & vascularized human brain organoids via imaging mass cytometry
Role: Principal Investigator

NIH R01 (R01AI1151301) grant 9/1/2020 – 8/31/2025
Biophysical regulation of macrophage function $2,062,810 total direct costs
Role: Co-Investigator

NIH/NINDS Diversity F31 04/01/2022 – 3/31/2024
Piezo1 Mobility Dynamics in Mechanotransduction $83,148 total direct costs
Trainee: Alan Ly
Role: Advisor

Completed

California Institute of Regenerative Medicine (CIRM) Training grant (EDUC4-12822) slot 1/1/2022 – 12/31/2023
$120,000 total direct costs
The role of Piezo1 in blood-brain-barrier formation and maintenance
Trainee: Dr. Elizabeth Evans
Role: Advisor

NIH/NINDS T32 Training Grant (NS082174) slot 10/1/2021 – 9/30/2023
Title: Piezo1 Mechanotransduction in AD Pathophysiology $79,384.60 total direct costs
Trainee: Gabriella Bertaccini
Role: Advisor

NIH New Innovator Award (DP2AT010376) 9/30/2018 – 8/31/2023
Building the brain: How mechanical forces shape human neural development $1,500,000 total direct costs
Role: Principal Investigator
Impact score: 10 (1st percentile)

Administrative Supplement to NIH DP2 grant 9/1/2020 – 8/31/2023
Administrative supplement aims to use novel molecular and bioengineering tools to examine the neuromechanobiology of Alzheimer's Disease. $250,000 total direct costs
Role: Principal Investigator

Administrative Supplement to NIH DP2 grant 9/1/2020 – 8/31/2023
Administrative supplement supports the development of a novel molecular tool to identify mechanoresponsive cells in human brain organoids. $100,000 total direct costs
Role: Principal Investigator

HHMI Gilliam Fellowship for Advanced Studies (GT11549) 9/1/2019 – 8/31/2022
Functional dynamics of Piezo1 and Traction Forces in Tissue Repair (in no-cost extension)
Role: Principal Investigator $150,000 total direct costs

Center for Multiscale Cell Fate Opportunity Award, UCI (IOA-2105) 1/1/2022 – 12/31/2022
Modeling PIEZO1 dynamics in keratinocyte migration during skin wound healing $10,000 total direct costs
Trainee: Jesse Holt
Role: Advisor

Center for Advanced Design & Manufacturing of Integrated Microfluidics (CADMIM) 3/1/2021 – 9/28/2022
$65,000 (D)
Low-Shear Organoid Vortex Array (LOVA)

NIH R21 grant 7/1/2020 – 6/30/2022
Mechanical regulation of skin repair and regeneration (in no-cost extension)
Role: Co-Investigator $275,000 total direct costs

NIH R21 grant 7/1/2020 – 8/31/2022
Regulation of microglia by tissue stiffness and Piezo1 in Alzheimer's disease (in no-cost extension)
Role: Co-Investigator $275,000 total direct costs

Diversity supplement to NIH R01 grant 4/1/2020 – 3/31/2022
This diversity supplement is for the mentoring and support of graduate student Alan Ly. $79,399 total direct costs
Role: Principal Investigator

UCI NIAMS P30 Skin Biology Resource-based Center seed grant 1/1/2021 – 02/28/2021
Piezo1 dynamics in keratinocyte migration during skin wound healing $35,000 direct costs
Major goals: The goal of this project is to examine a role for Piezo1 in keratinocyte migration during skin wound healing.
Role: MPI with PI Lowengrub

NIH R13 Conference grant 7/25/2018 - 7/24/2020
MechBio 2018: The Mechanome in Action $23,320 direct costs
Role: Principal Investigator

UCI Schools of Medicine and Biological Sciences Pilot Funding 8/1/2017 – 1/31/2019
Molecular and imaging approaches to visualize mechanotransduction in human neural development $50,000
Role: Principal Investigator

Sue and Bill Gross Stem Cell Research Center Seed Grant, UCI 2/1/2017 – 7/31/2018
Piezo1 in human neural stem cells $25,000
Role: Principal Investigator

Committee on Research Grant, School of Medicine Seed Grant, UCI 7/1/2017 – 6/30/2018
Molecular Tools for Imaging Mechanics of Human Neural Development $10,000
Role: Principal Investigator

NIH R21 2/1/2015 – 1/31/2018
Stretch-activated ion channels in human neural stem cell mechanotransduction $275,000
Role: Co-Investigator (Tombola PI)

UCI Center for Autism Research and Treatment 7/2013 – 2/2015
Membrane biophysical properties and Ca^{2+} dynamics in stem cells and neurons from autism spectrum disorders. $60,000
Role: Senior key personnel (Flanagan & Tombola co-PIs)

Benefunder 2015
Using Stem Cells to Repair the Damaged Brain $4,010
Community Outreach Funding
Role: Principal Investigator

SOM Faculty Research Grant 7/1/2011 – 5/31/2012
UCI Academic Senate Council on Research, Computing and Libraries Biophysical and functional studies on novel mammalian mechanotransduction channels $7,500
Role: Co-Investigator (Tombola PI)

Helen Hay Whitney Fellowship 4/1/2008 – 3/31/2011
Mapping components of the hair cell transduction machinery $138,000
Role: Principal Investigator

PUBLICATIONS

3182 citations from Google Scholar as of 01/2024 * denotes Equal Contribution
Profile: http://scholar.google.com/citations?user=xY16hvgAAAAJ&hl=en † denotes Co-corresponding Authors

Submitted manuscripts

28. Bertaccini GA, Evans EL, Nourse JL, Dickinson GD, Liu G, Casanellas I, Seal S, Ly AT, Holt JR, Yan S, Hui EE, Panicker MM, Upadhyayula S, Parker I, Pathak MM. PIEZO1-HaloTag hiPSCs: Bridging Molecular,

Cellular and Tissue Imaging. (2023). *bioRxiv, pre-print*. doi: https://doi.org/10.1101/2023.12.22.573117. *Under consideration at a journal.*

27. Tyagi V*, Ly AT*, Bertaccini GA, Evans EL, Freites JA, Tobias DJ†, **Pathak MM†.** Single-particle tracking and machine-learning classification reveals heterogeneous Piezo1 diffusion. *bioRxiv 2022. Under revision at a journal.* https://www.biorxiv.org/content/10.1101/2022.09.30.510193v1

Published manuscripts

26. Holt JR*, Chen J*, Evans EL, Lowengrub JS†, **Pathak MM†**. PIEZO1 regulates leader cell formation and cellular coordination during collective keratinocyte migration. *PLOS Computational Biology,* in press.
25. Yang S, Miao X, Arnold S, Li B, Ly AT, Wang H, Wang M, **Pathak MM,** Zhao W, Cox CD, Shi Z. Membrane curvature governs the distribution of Piezo1 in live cells. *Nature Communications. 13(7467) (2022).*
24. Nourse JL, Leung V, Abuwarda H, Evans EL, Izquierdo-Ortiz E, Ly A, Truong N, Smith S, Bhavsar H, Bertaccini G, Monuki E, Panicker MM, and **Pathak MM.** (2022). Piezo1 regulates cholesterol biosynthesis to influence neural stem cell fate during brain development. *Journal of General Physiology*, 154(10): e202213084.
    - *Discussed in:* Surprising discovery by UCI-led team links Piezo1 and cholesterol during brain development. https://www.eurekalert.org/news-releases/964041
    - Altmetric score of 167 (in the 95th percentile of articles of the same age)
23. Holt JR, Zeng W.-Z, Evans EL, Woo S.-H, Ma S, Abuwarda H, Loud M, Patapoutian A†, **Pathak MM†** (2021). Spatiotemporal dynamics of PIEZO1 localization controls keratinocyte migration during wound healing. *eLife* 2021;10:e65415.
    - *Discussed in:* UCI researchers reveal critical role of mechanosensor in skin wound healing. https://www.eurekalert.org/news-releases/934356
22. Atcha H, Meli VS, Davis CT, Brumm KT, Anis S, Chin J, Jiang K, **Pathak MM**, Liu WF (2021). Crosstalk Between CD11b and Piezo1 Mediates Macrophage Responses to Mechanical Cues. *Frontiers in Immunology*. 12:689397. eCollection 2021.
21. Atcha H, Jairaman A, Evans EL, **Pathak MM**, Cahalan MD, & Liu WF (2021). Ion channel mediated mechanotransduction in immune cells. *Current Opinion in Solid State and Materials Science*, *25*(6), 100951.
20. Jairaman A*, Othy S*, Dynes JL, Yeromin AV, Zavala A, Greenberg ML, Nourse JL, Holt JR, Cahalan SM, Parker I, **Pathak MM,** and Cahalan MD (2021). Piezo1 channels restrain regulatory T cell polarization but are dispensable for effector CD4+ T cell responses. *Science Advances, 7(28).*
19. Atcha H, Jairaman A, Holt JR, Meli VS, Nagalla RR, Veerasubramanian PK, Brumm KT, Lim HE, Cahalan MD, **Pathak MM,** and Liu WF (2021). Mechanically-activated ion channel Piezo1 modulates macrophage polarization and stiffness sensing. *Nature Communications, 12(1), 1-14.*
    - *Discussed in:* Liu's Immune System Research to Benefit Wound Healing. *UCI Samueli School of Engineering News. 2021, 6.* https://engineering.uci.edu/news/2021/6/liu-s-immune-system-research-benefit-wound-healing
18. Abuwarda H, **Pathak MM** (2020). Mechanobiology of neural development. *66, 104-111.* doi: https://doi.org/10.1016/j.ceb.2020.05.012. *Current Opinion in Cell Biology.* Special issue on Cell Dynamics.
    - *Invited review article*
17. Ellefsen KL*, Holt JR*, Chang A*, Nourse JL*, Arulmoli J, Mekhdjian A, Abuwarda H, Tombola F, Flanagan LA, Dunn AR, Parker I, **Pathak MM.** (2019). Myosin-II mediated traction forces evoke localized Piezo1 Ca^{2+} flickers. *Communications Biology*. 2, Article number: 298. A previous version of the article is available on the *bioRxiv* server.
    - *Discussed in:* Pulling in new directions: Myosin 2, Piezo, and metabolism by Quintanilla MA, Hammer JA, Beach JR. https://f1000research.com/articles/8-1486
    - *Highlighted as an Editor's Pick article in the Communications Biology 2 Year Anniversary Collection*
16. Zhao C, Sun Q, Cao Y, **Pathak MM**, Lu X, Yang Q. (2019). Mechanosensitive Ion Channel Piezo1 Regulates Adipose Inflammation and Systemic Insulin Resistance. Frontiers in Endocrinology. Jun 13;10:373.
15. Nourse JL and **Pathak MM.** (2017). How Cells Channel Their Stress: Interplay Between Piezo1 and the Cytoskeleton. *Seminars in Cell and Developmental Biology*. 2017 Nov; 71:3-12.
    - *Invited review article*

14. **Pathak MM*,** Tran T*, Hong L, Morris CE, Tombola F. (2016). The Hv1 proton channel responds to mechanical stimuli. *Journal of General Physiology.* 148(5):405-418.
    - *Recognized as the outstanding paper of the year by the Society of General Physiologists, through a Cranefield award to co-author, Francesco Tombola.*
13. Arulmoli J, Wright HJ, Phan D, Sheth U, Botten GA, **Pathak MM,** Zarembinski TI, Yanni DS, Razorenova OV, Hughes CCW, Flanagan LA. (2016). Combination scaffolds of salmon fibrin, hyaluronic acid, and laminin for human neural stem cell tissue engineering. *Acta Biomaterialia,* 1;43:122-38.
12. Phan L*, Kautz R*, Arulmoli J, Kim I, Le DT, Shenk MA, **Pathak MM†**, Flanagan LA†, Tombola F†, Gorodetsky AA† (2016). Reflectin as a Material for Neural Stem Cell Growth. *ACS Applied Materials & Interfaces.* 13;8(1):278-84
11. Arulmoli J, **Pathak MM,** McDonnell LP, Nourse JL, Tombola F, Earthman JC, Flanagan LA. (2015) Static stretch affects neural stem cell differentiation in an extracellular matrix-dependent manner. *Scientific Reports.* 5: 8499.
10. **Pathak MM†**, Nourse JL, Tran T, Hwe J, Arulmoli J, Le DTT, Bernardis E, Flanagan LA, Tombola F†. (2014) Stretch-activated ion channel Piezo1 directs lineage choice in human neural stem cells. *Proceedings of the National Academy of Sciences*. 111(45):16148-53.
9. Kim IH, Hevezi P, Varga C, **Pathak MM**, Hong L, Ta D, Tran CT, Zlotnik A, Soltesz I, Tombola F. (2014). Evidence for functional diversity between the voltage-gated proton channel Hv1 and its closest related protein HVRP1. *PLoS One*. 9(8):e105926.
8. Nourse JL*, Prieto JL*, Dickson AR, Lu J, **Pathak MM**, Tombola F, Demetriou M, Lee AP, Flanagan LA. (2014). Membrane biophysics define neuron and astrocyte progenitors in the neural lineage. *Stem Cells.* 32(3):706-16.
    - *Featured Publication, Neural Cell News, September 18, 2013*
7. Hong L, **Pathak MM**, Kim IH, Ta D, Tombola F. (2013). Voltage-sensing domain of voltage-gated proton channel Hv1 shares mechanism of block with pore domains. *Neuron.* 77(2):274-87.
    - *Commentary: Kalia & Schwartz (2013). Common principles of voltage-dependent gating for Hv and Kv channels. Neuron. 77(2):214-6.*
6. **Pathak MM*,** Yarov-Yarovoy V*, Roux B, Agarwal G, Kohout S, Barth P, Tombola F, Isacoff EY. (2007). Closing in on the resting state of the Shaker K^+ channel. *Neuron*. 56(1):124-40.
    - *Selected as the "Featured article" on Neuron website*
5. Tombola F, **Pathak MM**, Gorostiza P, Isacoff EY. (2007). The twisted ion-permeation pathway of a resting voltage-sensing domain. *Nature*. 445(7127):546-9.
    - *Faculty of 1000 recommendation, Exceptional (F1000 factor 3)*
4. Tombola F, **Pathak MM**, Isacoff EY. (2006). How does voltage open an ion channel? *Annual Review of Cell and Developmental Biology*. 22:23-52.
3. Tombola F, **Pathak MM**, Isacoff EY. (2005). How far will you go to sense voltage? *Neuron*. 48:719-25.
2. Tombola F, **Pathak MM**, Isacoff EY. (2005). Voltage-sensing arginines in a potassium channel permeate and occlude cation-selective pores. *Neuron*. 45:379-88.
1. **Pathak MM**, Kurtz L, Tombola F, Isacoff EY. (2005). The cooperative voltage sensor motion that gates a potassium channel. *Journal of General Physiology*.125:57-69.
    - *Cover article*

Publication gap from 2008 to 2012 due to health problems that have since been resolved through medical and surgical treatment. Details available on request.

PATENTS

1. **Provisional patent:** PP1 -- Pathak, M., Nourse, J. L., Flanagan, L. A., Tombola, F., Patent, "Direction of stem cell differentiation via Piezo1", 62116627, Provisional, United States, Applied 2017.
2. **Provisional patent:** Pathak, M., Nourse, J. L., Bertaccini, G., Patent, "A molecular sensor for mechanotransduction dynamics," 63339689, Provisional, United States, Applied May 2022.

INVITED TALKS

Upcoming

1. Biophysical Society 68th Annual Meeting, Philadelphia, PA. *Scheduled for February 2024*.
2. American Physiology Summit, Long Beach, CA. *Scheduled for April 2024.*
3. University of Santa Barbara, Santa Barbara, CA. *Scheduled for April 2024.*
4. Department of Molecular Physiology and Biophysics Seminar Series, University of Iowa. *April 2024.*
5. Columbia University, New York, NY. *Scheduled for 2024-25.*
6. Department of Cellular Biology Seminar Series, University of Georgia, Athens, GA. *Scheduled for 2024-25.*
7. Yonsei-Institute for Basic Science (IBS) Forum for physical modalities for neuroscience, Seoul, South Korea. *Scheduled for November 2021, postponed due to the Covid-19 pandemic.*
8. NIH National Heart Lung and Blood Institute (NHLBI) Seminar Series, Bethesda, MA. *Scheduled for April 2020, Postponed due to the COVID -19 pandemic.*

Completed

International, Conference

9. Invited talk, RECI Spanish Ion Channel Network Meeting, Spain, December 2023.
10. Invited talk, International Society of Mechanobiology, Sydney, Australia. November 2022.
11. Invited talk, European Calcium Society Meeting, Cork, Ireland. August 2022.
12. Invited talk, 9th World Congress of Biomechanics (WCB 2022), Hybrid Meeting (in person and virtual), Taipei, Taiwan. July 2022.
13. Universidad Nacional Autonoma de Mexico, Queretaro, Mexico. September 2019.
14. Force-gated Ion Channels Conference at Max Delbruck Center, Berlin, Germany. October 2018.

International, Seminars

15. Department seminar, Physiology Department at McGill University, Montreal, Canada. May 2022.
16. Cell Migration Seminars, International online seminar series, April 2021. YouTube link available at https://www.youtube.com/watch?v=TwKY51d21ZM&t=2262s.
17. Institute of Molecular and Cell Biology, Singapore. February 2016.
18. Mechanobiology Institute, Singapore. February 2016.
19. Tata Institute of Fundamental research (TIFR), Mumbai, India. October 2010.
20. National Centre for Biological Sciences, Bangalore, India, November 2006.
21. National Centre for Biological Sciences, Bangalore, India, September 2004.
22. St. Xavier's College, Ahmedabad, India, September 2004.

National, Conference

23. NIH High-Risk, High-Reward (HRHR) Research Symposium, NIH, Bethesda, MD. June 2023.
24. Invited talk, Biophysical Society Conference on Molecular Biophysics of Membranes, Lake Tahoe. June 2022.
25. Early Investigator Award talk, Mechanobiology Subgroup Symposium, Biophysical Society, February 2022
26. Virtual Workshop on "Mechanics in Physiological Systems: From Organelle to Organism". Fifth in a series of ten workshops serving an important role in shaping a new 15-lab, 15-year research program at HHMI's Janelia Research Campus, called 4D Cellular Physiology. June 2021. YouTube link available at https://youtu.be/rPm_Cvv7GpY?t=17363.
27. Invited Symposium talk, Annual meeting of the American Society for Biochemistry and Molecular Biology (ASBMB). April 2021.
28. Invited Symposium talk at Materials Research Society (MRS) Fall Meeting, Boston, MA. December 2019.
29. Didactic Workshop on Mechanobiology at Materials Research Society (MRS) Fall Meeting, Boston, MA. December 2019.
30. NIH NCCIH 20th Anniversary Symposium, NIH, Bethesda, MD. September 2019.
31. NIH workshop on "Neurocircuitry of Force-Based Manipulations", NIH, Bethesda, MD. September 2019.
32. Annual Meeting of the Biophysical Society Meeting, Mechanobiology subgroup, Baltimore, MD. March 2019.
33. FASEB Ion Channel Regulation conference, Steamboat Springs, CO. July 2017.
34. FASEB Ion Channel Regulation conference, Big Sky, MO. July 2015.
35. Force-gated Ion Channels Meeting. HHMI Janelia Research Campus, Ashburn VA. March 2015.

National, Seminars

36. Biological Physics / Physical Biology (BPPB) Seminar, Virtual, January 2024.
37. Ion Channel Modulation Symposium, UC Irvine, CA, October 2023.
38. NIH High Risk, High Reward (HRHR) seminar series, Virtual, January 2023.
39. Penn Institute for Regenerative Medicine (Penn IRM) Seminar Series, University of Pennsylvania, Philadelphia, PA. October 2022.
40. Bioengineering and Physiology Seminar Series, Mayo Clinic, Rochester, MN. May 2022.
41. Department seminar, Pharmacology & Regenerative Medicine at the University of Illinois College of Medicine, Chicago, IL. May 2021.
42. Bioengineering Department Colloquium Series, University of California, Riverside, March 2021.
43. Department seminar at Brandeis University's Biology and Neuro Seminar Series, Waltham, MA. Student invitation. February 2021.
44. Department of Biomedical Engineering seminar series, Purdue University, Lafayette, IN. November 2020.
45. Biological Physics seminar at Arizona State University, Tempe, AZ. October 2020.
46. Chemistry department Colloquium at Rutgers University, Piscataway, NJ. September 2020.
47. Ion Channels Supergroup Zoominar series, UT Austin, Austin, TX. May 2020.
48. Bridges to Stem Cell Research Annual Symposium, California State University, Fullerton, CA. March 2020.
49. Nature Conference on Engineering Biology for Medicine, Duke University, Raleigh, NC. May 2019.
50. Institute of Neuroscience, University of Tennessee Health Science Center, Memphis, TN. May 2019.
51. Western University Departmental Seminar Series, Pomona, CA. April 2019.
52. UCSD Quantitative Biology Seminar Series, San Diego, CA. February 2019.
53. Advanced Imaging Methods Workshop, UC Berkeley, Berkeley, CA. January 2019.
54. Department of Genetics, Cell Biology, and Development Seminar Series, University of Minnesota, Minneapolis, MN. September 2018.
55. NSF-funded seminar series for graduate students "Oh! The places you will go…with a PhD in science", Department of University of Tennessee, Knoxville, TN. April 2018.
56. Biomechanics and Mechanobiology seminars series, Dept. of Mechanical and Aerospace Engineering, University of California at San Diego, San Diego, CA. May 2017.
57. MechBio Symposium: Putting Together the Cell Mechanome. University of California at San Diego, San Diego, CA. August 2016.
58. Department of Cell & Molecular Physiology Seminar Series, Loyola University Medical School, Chicago, IL. May 2016.
59. Harold Lecar Memorial Symposium. UC Berkeley, CA. May 2014.

Local

60. UCI School of Medicine Dean's Research Council, Irvine, CA. September 2022.
61. Annual Symposium of the UCI Stem Cell Research Center, UC Irvine, Irvine, CA. April 2021.
62. UCI Department of Developmental and Cell Biology Seminar Series, Irvine, CA. October 2019.
63. UCI Department of Biological Chemistry Seminar Series, Irvine, CA. May 2019.
64. UCI Campus-wide Cancer Symposium, UC Irvine, Irvine, CA. May 2019.
65. UCI 3rd Annual Joint Faculty Retreat, UCI School of Medicine and School of Biological Sciences, UC Irvine, Costa Mesa, CA. April 2018.
66. UCI Center for Complex Systems Biology Annual Retreat, Los Angeles, CA. March 2018.
67. UCI 2nd Annual Joint Faculty Retreat, UCI School of Medicine and School of Biological Sciences, UC Irvine, Silverado, CA. May 2017.
68. Center for Autism Research and Treatment Monthly Seminar Series, UC Irvine, CA. January 2015.
69. Sue & Bill Gross Stem Cell Research Center Seminar series, UC Irvine, CA. Spring 2014 Seminar Series. May 2014.

PROFESSIONAL MEMBERSHIPS

Biophysical Society	2001 – Present
Harvard Women in Neuroscience	2007 – 2010
Association for Research in Otolaryngology	2007 – 2016
Biomedical Engineering Society	2014 – 2017
American Association for the Advancement of Science	2007 – Present
International Society for Stem Cell Research	2013 – Present

American Society for Cell Biology 2014 – Present

TEACHING EXPERIENCE

University of California, Irvine - Irvine, California
Instructor, *Medical Physiology and Anatomy,* PharmD Curriculum 2021 – Present

University of California, Irvine - Irvine, California
Instructor, *Mathematics, Computational and Systems Biology Graduate program bootcamp* 2020 - Present

University of California, Irvine - Irvine, California
Guest lecturer, *Cardiac Mechanobiology,* Biomedical Engineering Graduate Course 2019 – Present

University of California, Irvine - Irvine, California
Instructor, *Topics in Physiology,* Physiology & Biophysics Graduate Course 2018

University of California, Irvine - Irvine, California
Instructor, *Medical Physiology,* Medical Students Curriculum 2017 – Present

University of California, Irvine - Irvine, California
Instructor, *Physiology of Ion Channels* Graduate Course 2012 – Present

Marine Biological Laboratory - Woods Hole, Massachusetts
Teaching Assistant, *Biology of the Inner Ear* Summer Course 2009

Harvard Medical School - Boston, Massachusetts
Teaching Assistant, *Neuroscience* course for Graduate and Medical students 2008

University of California, Berkeley - Berkeley, California
Graduate Student Instructor, *Introduction to Neuroscience* 2003
Graduate Student Assistant, *Biophysical Neurobiology* 2001 – 2003

National Centre for Biological Sciences - Bangalore, India
Teaching Assistant, *Basic Neurobiology* 1999
Teaching Assistant, *Hands-on Workshop on Emerging Trends in Neurophysiology* 1999

COLLEAGUES MENTORED

Postdoctoral fellows

- Ignasi Casanellas Sept 2022 – Present
- Elizabeth Evans Jan 2020 – Nov 2023
    - Recipient of a CIRM Training grant fellowship

Medical Students

- Truc Tran, Pennsylvania State University, Hershey, PA Summer 2017
- Dai Trang Thi Le, University of Central Florida Summer 2016
    - Recipient of a UCF research grant for work done in the lab

Graduate Students, Thesis Mentor

- Laura Williamson, UCI MSTP Program (co-mentored with Dr. Lisa Flanagan) 2022 – Present
- Gabriella Bertaccini, UCI Cellular & Molecular Biosciences Graduate Student 2020 – Present
    - UCI Stem Cell Translational Medicine NIH T32 training grant awardee
    - 2023 Stanley Behrens Fellow in Medicine awardee Jan 2024
- Alan Ly, UCI Cellular & Molecular Biosciences Graduate Student 2019 – Present
    - Recipient of an NIH Diversity Supplement
    - Recipient of an NIH F31 pre-doctoral fellowship
- Jesse Holt, UCI, Physiology & Biophysics 2017 – Present
    - HHMI Gilliam Diversity Fellow
    - Eugene Cota Robles Diversity Fellow

  - Recipient of a $10,000 opportunity award from the Center for Multiscale Cell Fate at UCI, for a collaborative project with Dr. Wei-Zheng Zeng (Dr. Ardem Patapoutian's lab) in The Scripps Research Institute.
  - Recipient of a $2,500 travel award for a new collaborative project with Dr. Rizal Hariadi's lab at Arizona State University
  - Recipient of a $10,000 opportunity award from the Center for Multiscale Cell Fate at UCI, for a collaborative project with Jinghao Chem (Dr. John Lowengrub's lab) at Dept. of Mathematics, UCI.
- Chang Zhao, UCI Masters in Biotechnology, Co-mentored with Francesco Tombola and Lisa Flanagan — 2015 – 2016
- Rylan Katz, UCI, Chem. Engg. & Material Sci. (Primary Mentor: Alon Gorodetsky) — 2014 – 2016
- Janahan Arulmoli, UCI, Biomedical Engineering (Primary Mentor: Lisa Flanagan) — 2013 – 2016
- Iris Kim, UCI, Physiology & Biophysics (Primary Mentor: Francesco Tombola) — 2011 – 2014

Graduate Students, Rotation Mentor

- Joshua Alcantara, UCI Cellular & Molecular Biosciences Rotation Student — Fall 2022
- Jazmine Moore, UCI Inter-departmental Program in Neurosciences Rotation Student — Winter 2022
- John Corrette, UCI Mathematical, Computational, and Systems Biology rotation student — Spring 2021
- Cherie Lepe, UCI Inter-departmental Program in Neurosciences Rotation Student — Fall 2020
- Jacob Deyell, UCI Medical Scientist Training Program Graduate Student — Summer 2020
- Mulatwa Haile, UCI Inter-departmental Program in Neurosciences Rotation Student — Winter 2020
- Isabel Rivera, UCI Inter-departmental Program in Neurosciences Rotation Student — Winter 2019
- Nihal Eltom, UCI Inter-departmental Program in Neurosciences Rotation Student — Fall 2018
- Chloe Saras Thangavelu, Cellular & Molecular Biosciences Rotation Student — 2018 – 2018
- Haley Masters, UCI, Cellular & Molecular Biosciences Rotation Student — 2017 – 2017
- David Au, UCI, Cellular & Molecular Biosciences Rotation Student — 2017 – 2017
- Graduate student mentor for 4 Ph.D. rotation students, UC Berkeley — 2002 – 2006

Post-baccalaureate Students

- Vivian Leung — 2020 – Present
- Esmeralda Izqueirdo, UC Riverside — 2017 – 2018
- Nhu Nguyen, UCI — 2015 – 2016
- Dai Trang Thi Le, UCI (currently medical student at University of Central Florida) — 2014 – 2015
- Jennifer Hwe, UCI (currently post-bac. pre-medical student at Charles Drew Univ.) — 2013 – 2015

Undergraduate Students

- Alicia Margaret Lin, UCI undergraduate research student — Fall 2023 - Present
- Eden Vold, UCI undergraduate research student — Fall 2022 – Win. 2023
- Naomi Ferrer, UCI undergraduate research student — Fall 2022 – Present
- Michael Thanh-Phong Vu, UCI undergraduate research student — Win. 2021– Sum. 2022
  - UCI Summer Undergraduate Research Program grant awardee (2021)
- Elaine Lai, CSU Fullerton undergraduate research student — Jan – Dec 2021
  - CIRM Bridges Scholar
- Kaitlyn Manh, CSU Fullerton undergraduate research student — Jan – Dec 2020
  - CIRM Bridges Scholar
- Shayan Fini, UCI undergraduate research student — Winter 2020 – Present
  - UCI Summer Undergraduate Research Program grant awardee (2020)

- Abhishek Kulkarni, UCI undergraduate research student — Fall 2019 – Spring 2020
- Samantha Smith, UCI undergraduate research student — 2018 – Spring 2020
  - UCI Undergraduate Research Opportunities Program grant awardee (2020)
  - UCI Undergraduate Research Opportunities Program grant awardee (2019)
- Harsh Bhavsar, UCI undergraduate research student — 2018 – Spring 2020
  - UCI Undergraduate Research Opportunities Program grant awardee (2020)
  - UCI Undergraduate Research Opportunities Program grant awardee (2019)
- Brian Nguyen, UCI undergraduate research student — 2017 – 2018
- Ladelyn Boonlua, UCI undergraduate research student — 2017 – 2018
  - UCI Undergraduate Research Opportunities Program grant awardee (2017)
- Nguyen Minh Truong, UCI undergraduate research student — 2017 – 2018
  - UCI Undergraduate Research Opportunities Program grant awardee (2020)
  - UCI Undergraduate Research Opportunities Program grant awardee (2019)
  - UCI Undergraduate Research Opportunities Program grant awardee (2018)
- Huixun Du, UCI undergraduate research student — 2017 – Spring 2019
  - UCI Summer Undergraduate Research Program grant awardee (2018)
  - UCI Undergraduate Research Opportunities Program grant awardee (2018)
- Klara Zakery, UCI undergraduate research student — 2017 – 2018
- Adrija Chakrabarty, UCLA undergraduate research student — Summer 2017
- Juhi Gopal, UCI undergraduate research student — 2016 – 2018
- Hamid Abuwarda, UCI undergraduate research student — 2016 – 2018
  - Co-author on a research article
  - Robert Ernst Prize for Excellence in Research in the Biological Sciences (2018)
  - UCI Excellence in Research awardee (2018)
  - UCI Summer Undergraduate Research Program grant awardee (2017)
  - UCI Undergraduate Research Opportunities Program grant awardee (2017)
- Colleen Chau, UCI undergraduate research student — 2015 – 2016
  - UCI Summer Undergraduate Research Program grant awardee (2018)
  - UCI Undergraduate Research Opportunities Program grant awardee (2016)
- Christina Le, UCI undergraduate research student — 2014 – 2016
  - UCI Undergraduate Research Opportunities Program grant awardee (2016)
  - UCI Undergraduate Research Opportunities Program grant awardee (2015)
  - UCI Summer Undergraduate Research Program grant awardee (2015)
- Julie Self, Bates College — Summer 2015
- Truc Tran, UCI undergraduate research student — 2011 – 2014
  - Co-author on two research articles
  - UCI Excellence in Research awardee (2012)
  - UCI Undergraduate Research Opportunities Program grant awardee (2012)
  - UCI Undergraduate Research Opportunities Program grant awardee (2013)
  - UCI Summer Undergraduate Research Program grant awardee (2013)
- Chau Tran, UCI undergraduate research student — 2013 – 2014
  - Co-author on two research articles
- Heather Newman, UC Berkeley undergraduate research student — 2004 – 2005
- Lisa Kurtz, UC Berkeley undergraduate research student — 2001 – 2004
  - Co-author on a research article

High School Students

- Ria Bahadur, Eastside Preparatory, Seattle, WA — Jan 2021 – 2022

- Kianna Maria Dominick, Sage Hill High School, Newport Coast, CA — August 2019 – Spring 2020
- Tia Desarkar, Beckman High School, Tustin, CA — June 2019 – Spring 2020
- Ally Mendelhall, Tesoro High School, Las Flores, CA — Summer 2017
- Adam Clements, El Toro High School, Lake Forest, CA — 2016 – 2017
- Jessica Parpana, Tesoro High School, Las Flores, CA — Summer 2016
- Namita Prakash, Sage Hill School, Newport Coast, CA — 2015 – 2016
- Adrija Chakrabarty, Troy High School, Fullerton, CA — Summer 2015
- Zac Morton, Tesoro High School, Las Flores, CA — 2014 - 2015

PROFESSIONAL ACTIVITIES

Manuscript reviewer. ACS Nano, Advanced Science, Cell, eLife, F1000 Reviews, Frontiers in Cell and Developmental Biology, Frontiers in Pharmacology of Ion Channels and Channelopathies, Journal of Biological Chemistry, Journal of General Physiology, Journal of Neuroinflammation, Journal of Neuroscience, Nature Communications, Plos One, PNAS, Scientific Reports.

Ad hoc grant reviewer

Deutsche Forschungsgemeinschaft (German Research Foundation) — 2023 - 2024

Chan Zuckerberg Institute, reviewer for Dynamic Imaging grants program — September 2022

National Center for Complementary and Integrative Health, NIH, Neural Mechanisms of Force-Based Manipulations: High Priority Research Networks (U24), Special emphasis review panel — October 2021

Intercellular Interactions (ICI) NIH study section, National Institutes of Health — June 2021

HHMI Gilliam Fellowship for Advanced Study, Howard Hughes Medical Institute — February 2021

Intercellular Interactions (ICI) NIH study section, National Institutes of Health — February 2021

NIH-funded Center of Biomedical Research Excellence (COBRE) Pilot Proposal for the University of Delaware — November 2020

NSF Directorate of Engineering grant review panel — July 2020

United Kingdom Research and Innovation (UKRI), Biotechnology and Biological Sciences Research Council — March 2020

Neurotransporters, Receptors, Channels and Calcium Signaling (NTRC) study section, National Institutes of Health — 2018

Human Frontier Science Program — 2017

Organizer, member organized session, Annual Meeting of the Biophysical Society — February 2023

Co-organized a platform session on Mechanosensitive Membrane Proteins at the Annual Meeting of the Biophysical Society.

Panelist

Panel discussion on "Achieving Work-Life Balance Across Different Job Sectors". Annual Meeting of the Biophysical Society — February 2023

Poster Judge

International Society for Mechanobiology Conference, Sydney, Australia

Poster Judge — June 2022

Biophysical Society conference on Molecular Biophysics of Membranes, Lake Tahoe.

Panelist — November 2021

Panel discussion on "Navigating your first year as PI". Intersections Science Fellows Program

Biophysics Colab, Founding Member — Sep 2021 – Present

Biophysics Colab is a collaboration of biophysicists who are working in partnership with eLife to improve the way in which original research is evaluated.

***Treasurer* - Mechanobiology subgroup of the Biophysical Society** Feb 2021 – Feb 2023
Managed the budget and fundraising for the subgroup, co-organized and co-chaired the 2023 subgroup symposium.

bioRxiv Academic Affiliate 2019 - Present

***Journal of General Physiology* Editorial Advisory Board Member** 2019 - 2021

Session chair April 2021
Annual Symposium of the UCI Stem Cell Research Center, UC Irvine, Irvine, CA

Session chair Dec 2019
Materials Research Society Fall Meeting, Boston, MA.

Panelist May 2019
Nature Conference Panel Discussion on How to Design a Scientific Project: Hypothesis Generation, Study Design, and How to Deal with Potential Failure

Conference chair 2018
The Mechanome in Action, July 26-27 2018, UC Irvine.

Member
Early Careers Committee of the Biophysical Society 2013 – 2019
Organized workshops at Biophysical Society Meetings:
"Setting up your lab as an Assistant Professor" 2016
"Grant Opportunities for Early Career Faculty" 2015
"Moving on from your Postdoc Position: Negotiating the Transition" 2014

Abstract Reviewer 2015
Biomedical Engineering Society Annual Meeting, Tampa, Florida

Panelist 2015
Grant-writing workshop organized by the UCI Postdoc Association

Ad hoc consultant 2015
Global Biological Standards Institute

Judge 2014
Poster Competition, American Society Cell Biology Annual Meeting, Philadelphia, PA

Workshop Organizer 2010
"Biosciences in India: Directions, Challenges and Opportunities" An Early Careers Committee Workshop at the Biophysical Society Meeting. San Francisco, California

Workshop Organizer 2009
"Wanted by India: A discussion meeting on academic career options in the Biosciences", UCSF, San Francisco, California

Career Workshop Panelist 2004
Careers in Bioscience and Biotechnology Workshops:
St. Xavier's School, Ahmedabad, India
L.A.D College of Women, Nagpur, India

Executive Committee & Admissions Committee Member 2001 – 2002
Berkeley Biophysics Group

MEDIA COVERAGE

Surprising discovery by UCI-led team links Piezo1 and cholesterol during brain development
https://www.eurekalert.org/news-releases/964041

UCI researchers reveal critical role of mechanosensor in skin wound healing, 9 Nov 2021
https://www.eurekalert.org/news-releases/934356

New PI Slack, PI of the Month. 15 Jan 2019
https://newpislack.wordpress.com/2019/01/13/medha-pathak-ph-d/

Interview: Neuroscientist Medha Pathak and the "Mechanome in Action". 16 Nov 2018
https://oscillations.net/2018/11/16/neuroscientist-medha-pathak-and-the-mechanome-in-action/

UCI researcher awarded NIH Director's New Innovator Award. 2 Oct 2018
https://www.eurekalert.org/pub_releases/2018-10/uoc--ura093018.php

INSTITUTIONAL SERVICE

Service to the Department

Faculty Recruitment Committees

Co-Chair, Tissue Engineering search committee, FHLRE Initiative with SCRC	2022-2023
Member, Tissue Engineering search committee, FHLRE Initiative with SCRC	2018 – 2020
Professor-in-Residence faculty position	2018 – 2019
Vision Cluster, SOM Cluster Hiring Initiative	2017 – 2018
Neurodevelopment Cluster, SOM Cluster Hiring Initiative	2016 – 2018
SOM Research Computing Committee, Department representative	2007
Co-ordinated talks, workshops panel discussions	2016 – Present

- Writing workshop for grad students and postdocs
- Panel discussion on how to communicate with your local elected official on science policy
- Department research seminars

Service to the Sue Bill Gross Stem Cell Research Center

Co-Chair, Tissue Engineering search committee, FHLRE Initiative with Physiology	2022 - 2023
Shared Resource Committee Member	2018 – Present
Host for speakers in the SCRC seminar series	2017 - Present
Participation in writing training grants and equipment grants	2021 – Present
Faculty Recruitment Committee, Tissue Engineering, FHLRE Cluster Hiring Initiative	2018 – 2020
CRISPR Core Committee Member for hiring Core facility manager	2018
Event coordinator, Panel Discussion on How to Communicate With Your Local Congressperson (joint event with the Department of Physiology)	2017
Search committee member for hiring core facility manager	2017
Poster Judge, Stem Cell Awareness Day Symposium	2016
Faculty Recruitment Initiative, contributed to writing the proposal for the Faculty Hiring for Leveraged Research Excellence proposal	2016

Service to Graduate Programs

Cellular and Molecular Biology Graduate Program, Co-chair, Preliminary Exam Committee	2019
Cellular and Molecular Biology Graduate Program, Faculty Interviewer	2019
Center for Complex Biological Sciences, Panelist, Applying for Fellowships and Grants	2019
Medical Scientist Training Program (MSTP) Admissions Committee, Member	2018 – 2019
Behrens Graduate Fellowship Interview Committee Member	2018
Cellular and Molecular Biology Graduate Program, Prelim exam Committee Member	2018
Cellular and Molecular Biology Graduate Program, Faculty Interviewer	2017
Inter-departmental Neuroscience Program, Faculty Interviewer	2017
Cellular and Molecular Biology Graduate Program, Prelim exam Committee Member	2017
Cellular and Molecular Biology Graduate Program, Admissions Committee Member	2016 – 2017

DIVERSITY AND OUTREACH ACTIVITIES

Improv to Improve Your Science, 6-part HHMI-funded workshop for graduate students	2021 – 2022

Lead faculty contact for UCI at the *Intersections Science Fellows Symposium*, symposium to showcase the research of outstanding postdocs on the faculty job market who have significantly contributed to promoting Diversity, Equity and Inclusion within academia and/or are members of groups historically underrepresented in academia — 2021, 2022

UCI School of Medicine Graduate Academic Community Forum on Anti-BIPOC Racism, Breakout Room Discussion Leader for "Mentorship by Faculty" — July 2020

Demystifying the Hidden Curriculum, organized HHMI-funded workshops to support diversity at graduate level:

Academic Calendaring	September 2020
Navigating Your Writing Path	August 2020
Project Management: Hunks, Chunks & Bites, Parts I and II	July 2020
Strategies & Mindsets to Protect Your Time, Energy & Attention	April 2020

Overcoming Imposter Syndrome, workshops to support diversity at graduate level — February 2020

PROFESSIONAL DEVELOPMENT TRAINING

UCI School of Medicine Dean's Women's Leadership Academy — 2021 - 2022

HHMI Gilliam Mentorship Skills Development Training Workshop, Part II — 9/23/2021 – 9/24/2021

HHMI Gilliam Mentorship Skills Development Training Workshop, Part I — 4/1/21 – 4/2/21

HHMI Inclusive Learning Series, Harvard Business School — 11/5/20 – 2/18/21

iCAM: Introduction to Culturally Aware Mentorship, HHMI Gilliam Mentor training and the University of Wisconsin-Madison — March 2021

HHMI Gilliam Mentorship Training, Howard Hughes Medical Institute and the University of Wisconsin's Center for the Improvement of Mentored Experiences in Research (CIMER) — 10/1/19 – 3/31/21

EMBO Laboratory Leadership Course for Group Leaders, Stowers Institute, Kansas City, MO. — 4/8/19 – 4/13/19

AAMC Early Career Women Faculty Leadership Development Seminar, San Diego, CA. — 2/2/19 – 2/5/19

Faculty Success Program, National Center for Faculty Development & Diversity, Online. — 8/26/18 – 11/17/19

Optical Microscopy and Imaging in the Biological Sciences, Marine Biological Laboratory, Woods Hole, MA. — 9/7/16 – 9/17/16

Young Investigator meeting, Poovar, Kerala, India. — 2/24/09 – 2/28/09

Biology of the Inner Ear – Experimental and Analytical Approaches, Marine Biological Laboratory, Woods Hole, MA. — 8/19/07 – 9/1/07