

Harini Iyer

Assistant Professor of Biosciences, Rice University (January 2024-)

Members of my laboratory seek to decipher the complex interplay between the nervous and immune systems during development, homeostasis, and in neurodegeneration from the perspective of microglia, the sentinel immune cells of the brain. Our primary objective is to understand the fundamental principles of microglia biology and the activation of lysosomal pathways in these critical glial cells. We investigate microglia in their niche using zebrafish by exploiting the many experimental advantages of this vertebrate model organism, such as the accessibility to live imaging, the feasibility of large-scale CRISPR screens, and the availability of transgenic tools to visualize microglia in vivo.

Lab website: <https://iyerlaboratory.org/>

Education and Training

Stanford University	Postdoctoral Fellowship	2023
University of Illinois at Urbana-Champaign	Ph.D.	2017

Research Experience

Postdoctoral Research Scholar 2017 - 2023

Illuminating the cell biology of microglia using zebrafish. I defined a lysosomal regulatory circuit essential for the chemotaxis and function of microglia and developed tools to visualize the endolysosomal pathway in vivo. I demonstrated that the Chloride Channel CIC-7 is essential for phagocytic clearance by microglia. I performed CRISPR screens in zebrafish to elucidate the functions of genes mutated in Alzheimer's disease patients with a special focus on genes enriched in microglia and expressed in lysosomal compartments.

Graduate Research Assistant 2010 - 2017

Germ cell development in free-living and parasitic flatworms. My graduate research revealed that the transcription factor NF-YB and the RNA-binding protein Boule are required for the maintenance of male germline stem cells in free-living planarians. I also contributed to the understanding of somatic and germline stem cells in parasitic schistosomes.

Grants and Fellowships

- **BrightFocus Foundation Postdoctoral Fellowship** (*Role: PI*) 2022 - 2024
- **Stanford Alzheimer's Disease Research Center and National Institute on Aging Developmental Project Award** (*Role: PI*) 2021 - 2023
- **American Heart Association Postdoctoral Fellowship** (*Role: Fellow*) 2018 - 2020
- **School of Medicine Dean's Postdoctoral Fellowship** (*Role: Fellow*) 2017 - 2018
- **Block Grant Fellowship** (*Role: Fellow*) 2010

Honors and Awards

- Intersections Science Fellows Symposium Associate 2023
- Justice, Equity, Diversity, and Inclusion Champion Award, Stanford University 2022
- NK and Irene Cheung Family Scholar Award, Keystone Symposia 2022
- Marine Biological Laboratory Endowed Scholarship 2019
- Tunji Toogun Research Excellence Award, University of Illinois 2018
- Trainee Award, Symposium for International Research and Innovations in Schistosomiasis 2016

Publications

1. **Iyer, H.**, Talbot, W.S. 2024. The Cl⁻ transporter CIC-7 is essential for phagocytic clearance by microglia. *J Cell Sci* 137(4): jcs261616.
2. **Iyer, H.**, Shen, K., Meireles, A.M., Talbot, W.S. 2022. A lysosomal regulatory circuit essential for the development and function of microglia. *Sci Adv* 8(35):eabp8321.
3. Gan, L., Seki, A., Shen, K., **Iyer, H.**, Han, K., Hayer, A., Wollman, R., Ge, X., Lin, J.R., Dey, G., Talbot, W.S., Meyer, T. 2019. The lysosomal GPCR-like protein regulates Rag and mTORC1 localization and activity. *Nat Cell Biol* 21(5):614-626.
4. Meireles, A.M., Shen, K., Zoupi, L., **Iyer, H.**, Bouchard, E.L., Williams, A., Talbot, W.S. 2018. The lysosomal transcription factor TFEF regulates myelination downstream of the Rag-Ragulator complex. *Dev Cell* 47(3):319-330.
5. **Iyer, H.**, Issigonis, M., Sharma, P.P., Extavour, C.G., P.A. Newmark. 2016. A premeiotic function for *boule* in the planarian *Schmidtea mediterranea*. *Proc Natl Acad Sci USA* 113(25): E3509-18.
6. **Iyer, H.**, Collins III, J.J., P.A. Newmark. 2016. NF-YB regulates spermatogonial stem cell self-renewal and proliferation in the planarian *Schmidtea mediterranea*. *PLoS Genet* 12(6): e1006109.
7. Collins III, J.J., Wendt, G.R., **Iyer, H.**, P. A. Newmark. 2016. Stem cell progeny contribute to the schistosome host-parasite interface. *eLife*. 5:243.
8. Collins III, J.J., Wang, B., Lambrus, B.G., Tharp, M., **Iyer, H.**, and P. A. Newmark. 2013. Adult somatic stem cells in the human parasite, *Schistosoma mansoni*. *Nature*. 494: 476-479.
9. Naik, M., Raichurkar, A., Bhandodkar, B.S., Varun, B.V., Bhat, S., Kalkhambkar, R., Murugan, K., Menon, R., Bhat, J., Paul, B., **Iyer, H.**, et al. 2015. Structure Guided Lead Generation for *M. tuberculosis* Thymidylate Kinase (Mtb TMK): Discovery of 3-Cyanopyridone and 1,6-Naphthyridin-2-one as Potent Inhibitors. *J Med Chem*. 58(2): 753-66.
10. Balasubramanian, V., Solapure, S., **Iyer, H.**, et al. 2014. Bactericidal activity and mechanism of action of AZD5847, a novel oxazolidinone for treatment of tuberculosis. *Antimicrob Agents Chemother*. 58(1): 495-502.
11. Gising, J., Nilsson, M.T., Odell, L.R., Yahiaoui, S., Lindh, M., **Iyer, H.**, et al. 2012. Trisubstituted imidazoles as *Mycobacterium tuberculosis* glutamine synthetase inhibitors. *J Med Chem*. 55(6): 2894-8.
12. Andaloussi, M., Lindh, M., Björkelid, C., Suresh, S., Wieckowska, A., **Iyer, H.**, et al. 2011. Substitution of the phosphonic acid and hydroxamic acid functionalities of the DXR inhibitor FR900098: An attempt to improve the activity against *Mycobacterium tuberculosis*. *Bioorg Med Chem Lett*. 21(18): 5403-7.
13. Andaloussi, M., Henriksson, L.M., Więckowska, A., Lindh, M., Björkelid, C., Larsson, A.M., Suresh,

S., **Iyer, H.**, et al. 2011. Design, synthesis, and X-ray crystallographic studies of α -aryl substituted fosmidomycin analogues as inhibitors of *Mycobacterium tuberculosis* 1-deoxy-D-xylulose 5-phosphate reductoisomerase. *J Med Chem.* 54(14): 4964-76.

Reviews and Comments

1. **Iyer, H.**, Benoist, C., Bilbo, S.D., Boulanger, L.M., Burton, M.D., Daniels, B.P., Deczkowska, A., Flajnik, M.F., Gareau, M.G., Grace, P.M., Irazoqui, J.E., Reynolds, T.L., Rosi, S., Salinas, I., Schaefer, A., Sokol, C.L., Williams, D.W., and Klein, R.S. 2025. Systems Neuroimmunology: Current Bottlenecks, Research Priorities and Future Directions. *Nature Immunology.* 10.1038/s41590-025-02092-z.

Thesis Committees

• Beatrice Pffor	Systems, Synthetic, and Physical Biology (Ph.D.)	Advisor	2025 -
• Emilio Méndez Scolari	Biochemistry and Cell Biology (Ph.D.)	Advisor	2025 -
• Jorge Arnez Gonzales	Biochemistry and Cell Biology (M.S.)	Member	2025 -
• Kaleigh Arnold	Ecology and Evolutionary Biology (Ph.D.)	Member	2024 -
• Megan Daneman	Biochemistry and Cell Biology (M.S.)	Member	2024 -
• Dean Parenteau	Biochemistry and Cell Biology (Ph.D.)	Member	2024 -
• Paul Spezza	Bioengineering (Ph.D.)	Member	2024 -

Mentoring

• Mari Iida	Rice TOMODACHI-STEM intern		2025
• Rotation students	5 BCB and 1 SSPB graduate students		2024
• Othniel Amanyi	Undergraduate researcher (NEUR 310)		2024 -
• Ayra Badarpura	Undergraduate researcher (BIOS 310)		2024
• Murtaza Kazmi	Undergraduate researcher (BIOS 310)		2024
• Ranel Tuplano	Stanford Summer Research Program* scholar		2022
• Vikram Mani	High School researcher		2022
• Dunya Shuman	Community College Outreach Program* researcher		2022
• Rotation students	Department of Developmental Biology, Stanford University		2017 - 2022
• Caitlin Dingwall	Undergraduate researcher		2016 - 2017

* *These programs are designed to enhance diversity, inclusion, and equity in STEM fields*

Teaching

• Behavioral Neuroscience (BIOS 442)	Instructor of record		2024
• Developmental Biology	Teaching Assistant and Journal Club Discussion leader		2013

(MCB 410)

Invited Presentations

- Texas A&M University, Department of Biology, College Station, TX 2025
- Gulf Coast Undergraduate Research Symposium, Houston, TX (Keynote) 2024
- Aquatic Models of Human Disease conference, San Antonio, TX 2024
- Systems Neuroimmunology meeting, Banbury Center CSHL, Huntington, NY 2024
- Zebrafish Disease Models Society, 16th annual conference, Durham, NC 2023
- Structural Birth Defects Trainee Symposium (*virtual*) 2023
- University of Massachusetts Amherst, Department of Biology, Amherst, MA 2023
- Keystone Symposia: Neuroimmune Interactions, Vancouver, BC 2023
- University of Wyoming, Department of Molecular Biology, Laramie, WY 2023
- University of New Mexico, Department of Biology/NIH FIRST program, Albuquerque, NM 2023
- University of Utah, Department of Biology, Salt Lake City, UT 2023
- University of Kansas, Department of Molecular Biosciences, Lawrence, KS 2023
- Ethel Browne Harvey Postdoctoral Seminar Series (*virtual*) 2022
- Rice University, Department of Biosciences, Houston, TX 2022
- UTHealth San Antonio, Department of Cellular and Integrative Physiology, San Antonio, TX 2022
- International Society for Molecular Neurodegeneration (*virtual*) 2022
- Aquatic Models of Human Disease conference, Woods Hole, MA 2022
- University of San Francisco, Department of Biology, San Francisco, CA 2022
- Syracuse University, Early Career Research in Neuroscience seminar series (*virtual*) 2022
- International Zebrafish Society, 17th annual conference, Montreal, QC 2022
- Zebrafish Disease Models Society, Neural Disorders Research Interest Group (*virtual*) 2019
- Society for Developmental Biology, 75th annual conference, Boston, MA 2016
- Symposium for International Research and Innovations in Schistosomiasis, Washington, DC 2016
- North American Planarian Meeting, Chicago, IL 2015
- Germ Cell Meeting, Cold Spring Harbor Laboratory, NY 2014

Departmental Service

- Undergraduate Curriculum Committee Neuroscience 2024 -
- Undergraduate Recruiting and Advising Committee Biosciences 2024 -

Scientific Community Service

- Reviewing editor eLife 2025 -
- Application reviewer National Science Foundation, Graduate Research Fellowships Program 2025

- **Co-leader** Neural Disorders Research Interest Group, 2024 - 2027
Zebrafish Disease Models Society
- **Member-at-large** Early Career Investigator (ECI) committee, 2023 - 2025
Zebrafish Disease Models Society
- **Member** Publication and Communications Committee, 2023 - 2027
Society for Developmental Biology
- **Reviewer** eLife, Developmental Cell, Cell Reports, 2017 -
Acta Neuropathologica, BMC Genomics,
Molecular Brain, Aquatic Toxicology

Community Outreach and Volunteering

- **Session co-host** Gulf Coast Undergraduate Research Symposium, 2024
Rice University
- **Invited speaker** Palo Youth in Medicine Outreach, 2022
Palo Alto High School
- **Research mentor** Community College Outreach Program, 2022
Stanford University
- **Leadership committee** Community College Outreach Program, 2021 - 2022
Stanford University
- **Journal club leader** Justice, Equity, Diversity, and Inclusion committee, 2021 - 2022
Alzheimer's Disease Research Center,
Stanford University
- **Organizer** Neuroimmunity Group Seminar Series, 2019 - 2022
Stanford University
- **Instructor** Zebrafish injection training camp, 2018 - 2019
Departments of Developmental Biology and Genetics,
Stanford University
- **Mentor** ADVANCE program, 2018 - 2019
Stanford University
- **Application reviewer** Stanford Summer Research Institute program, 2018 - 2019
Stanford University
- **Instructor** Splash, Stanford University 2018
- **Outreach volunteer** California Academy of Sciences NightLife 2018
- **Outreach volunteer** Science and Technology Camp, 2012 - 2014
Orpheum Children's Museum, Urbana
- **Member** Graduate Student Council, 2012 - 2016
(Chair 2013 - 2015) University of Illinois at Urbana-Champaign
- **Member** Student Seminar Committee, 2012 - 2016
(Chair 2013 - 2015) University of Illinois at Urbana-Champaign

Training and Workshops

- BrightFocus Alzheimer's Fast Track 2022
- Zebrafish Development and Genetics course, Marine Biological Laboratory 2019
- Commercialization intern, Office of Technology Management, University of Illinois 2015 - 2016

Professional Memberships

- Genetics Society of America 2023 -
- The American Society for Cell Biology 2023 -
- International Zebrafish Society 2021 -
- Zebrafish Disease Models Society 2021 -
- Society for Developmental Biology 2012 -