

Samhitha Raj, PhD

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TEACHING / RESEARCH INTERESTS

Introductory / General Biology | Molecular Biology | Cellular Biology | Developmental Biology
Genetics and Genomics | Active Learning Techniques | Assessing Learning Outcomes | Advising / Mentoring
Curriculum / Program Development | University Initiation / Startup | Diversity, Equity, and Inclusion

EDUCATION

UNIVERSITY OF MICHIGAN - Ann Arbor, MI
Doctor of Philosophy (PhD) in Molecular, Cellular and Developmental Biology (MCDB) 2018

JSS SCIENCE AND TECHNOLOGY UNIVERSITY - Mysore, India
Bachelor of Engineering in Biotechnology 2011

PROFESSIONAL APPOINTMENTS

FULBRIGHT UNIVERSITY VIETNAM - Ho Chi Min City, Vietnam
Founding Undergraduate Faculty Member 2018 - Present

UNIVERSITY OF MICHIGAN - Ann Arbor, MI
Engaged Pedagogy Initiative (EPI) Fellow 2017 - 2018
Doctoral Researcher, Laboratory of Prof. Robert Denver 2012 - 2018
Executive Member and Instructor, Developing Future Biologists (DFB) 2015 - 2017
Graduate Student Instructor, Biology 2013 - 2014

UNIVERSITY OF VERACRUZ - Xalapa, Mexico
Instructor, Clubes de Ciencia 2017 - 2017

CENTER FOR DNA FINGERPRINTING AND DIAGNOSTICS - Hyderabad, India
Indian Academy of Sciences Undergraduate Research Fellow, Dept. of Molecular Genetics 2017 - 2017

TEACHING EXPERIENCE

FULBRIGHT UNIVERSITY VIETNAM - Ho Chi Min City, Vietnam
Founding Undergraduate Faculty Member 2018 - Present

- Courses developed / instructed:
 - *Introductory Biology* (Spring 2021): 25 undergraduate students per section.
 - *Biology of Infectious Diseases* (Spring 2020): 25 students per section.
 - *Logic and Limitations* (Fall 2019): 25 students per section.
 - *Scientific Inquiry* (Fall 2018, Fall 2020, Spring 2021): 25 students per section.

UNIVERSITY OF MICHIGAN - Ann Arbor, MI
Engaged Pedagogy Initiative (EPI) Fellow 2017 - 2018

- Course developed:
 - *Understanding Molecular Biology of Genetically Inherited Diseases* (Fall 2017): Semester-long undergraduate course exploring applications of molecular biology and genomics through hands-on application of theories.

TEACHING EXPERIENCE

UNIVERSITY OF VERACRUZ – Xalapa, Mexico

Instructor, Clubes de Ciencia**2017 – 2017**

- Course developed / instructed:
 - *Molecular and Developmental Biology* (Summer 2017): led section with 20 students with English as a second language in an active learning and lab-based course covering early embryology, cellular fate, and development.

UNIVERSITY OF MICHIGAN – Ann Arbor, MI

Executive Member and Instructor, Developing Future Biologists (DFB)**2015 – 2017**

- Course developed:
 - *Developmental Biology* (Fall 2016, Fall 2017): Designed and led portable developmental biology laboratory course in for 45–50 undergraduate students at partner institutions lacking resources for research and serving students underrepresented in sciences.

UNIVERSITY OF MICHIGAN – Ann Arbor, MI

Graduate Student Instructor, Biology**2013 – 2014**

- Courses instructed:
 - MCDB 429: *Cellular and Molecular Biology Laboratory* (Winter 2014): Led four-hour labs twice a week to 20 junior- and senior-level undergraduates.
 - BIO 172: *Introduction to Biology* (Fall 2013): Taught groups of 25–30 freshman and sophomore students, six hours per week.

MENTORING EXPERIENCE

FULBRIGHT UNIVERSITY VIETNAM – Ho Chi Min City, Vietnam

Experiential Learning Mentor**2020 – Present****Undergraduate Teaching Mentor****2018 – Present**

UNIVERSITY OF MICHIGAN – Ann Arbor, MI

Research Supervisor**2013 – 2018**

- Undergraduate Research Supervisor (Samantha Fontana), 2016 – 2018
- Graduate (Masters) Student Supervisor (Cesar Rodriguez), 2015 – 2017
- Undergraduate Student Supervisor (Preeta Gupta), 2013 – 2015

RESEARCH EXPERIENCE

UNIVERSITY OF MICHIGAN – Ann Arbor, MI

Doctoral Researcher, Laboratory of Prof. Robert Denver**2012 – 2018**

- Examined global DNA demethylation patterns during post-embryonic brain development in the *Xenopus* tadpole brain.
- Discovered locus-specific thyroid hormone mediated DNA demethylation around known thyroid hormone response elements in developing *Xenopus* tadpole brain.
- Investigated thyroid hormone-mediated induction of gene-encoding enzymes that catalyze DNA demethylation.
- Explored genome-wide association of thyroid hormone receptors to chromatin in developing *Xenopus* tadpole brain.

PROFESSIONAL SERVICE

FULBRIGHT UNIVERSITY VIETNAM – Ho Chi Min City, Vietnam	
Pedagogy Outreach Committee Chair	2019 – Present
Curriculum Development Committee Member	2019 – Present
Faculty Hiring Committee Member	2018 – Present
Wellness Task Force Member	2018 – 2019
UNIVERSITY OF MICHIGAN – Ann Arbor, MI	
Graduate Student Peer Mentor	2015 – 2016

CERTIFICATIONS

UNIVERSITY OF MICHIGAN, CENTER FOR RESEARCH ON LEARNING AND TEACHING (CRLT) – Ann Arbor, MI	
Graduate Student Teaching Certification	2013 – 2017

PUBLICATIONS

* Co-first authors

Raj S, Kyono Y, Sifuentes CJ, Arellanes-Licea EDC, Subramani A, Denver RJ. Thyroid Hormone Induces DNA Demethylation in Xenopus Tadpole Brain. *Endocrinology*. 2020;161(11):bqaa155. DOI: 10.1210/endo/bqaa155.

Kyono Y*, **Raj S***, Sifuentes CJ*, Buisine N, Sachs L, Denver RJ. DNA methylation dynamics underlie metamorphic gene regulation programs in Xenopus tadpole brain. *Developmental Biology*. 2020;462(2):180-196. DOI: 10.1016/j.ydbio.2020.03.013.

Pinskey JM*, Dulka E*, Ramos AI, Echevarria-Andino M, Lorberbaum DS, Carpenter BS, Martinez-Marques J, **Raj S**, Chin A, Gumucio DL, Wellik DM, Marty Santos L, Suárez-Martínez E, Allen BL, Barolo S. Developing Future Biologists: creating and assessing a portable short course to engage underrepresented undergraduate students in developmental biology. bioRxiv 467092. 2018; DOI: 10.1101/467092.

Bagamasbad PD, Bonett RM, Sachs L, Buisine N, **Raj S**, Knoedler JR, Kyono Y, Ruan Y, Ruan X, Denver RJ. Deciphering the regulatory logic of an ancient, ultra-conserved nuclear receptor enhancer module. *Molecular Endocrinology*. 2015;29(6):856-72. DOI: 10.1210/me.2014-1349.

PRESENTATIONS

Raj S, Phan H. Innovative Approaches to Transdisciplinary STEM Education in Vietnam. Poster presented at: 2019 AAC&U STEM Conference. Proceedings of the Association of American Colleges and Universities Conference on Transforming STEM Higher Education; 2019 Nov 7-9; Chicago, IL.

Raj S. CRISPR / Cas9 Technology. Invited speaker at: Instituto Tecnológico y de Estudios Superiores de Monterrey; 2017 Nov 7; Mexico City, Mexico.

Raj S. New approaches to University Education in Asia: Fulbright University Vietnam; 2018 Apr 19-21; Ho Chi Minh City, Vietnam.

Raj S, Kyono Y, Rodriguez CK, Denver RJ. Developmental and T3- dependent DNA demethylation in *Xenopus* tadpole brain during metamorphosis. Poster presented at: ICCE18. Proceedings of the 18th International Congress of Comparative Endocrinology; 2017 Jun 4-9; Lake Louise, Canada.

PRESENTATIONS

- Raj S**, Kyono Y, Rodriguez CK, Denver RJ. Developmental and T3- dependent DNA demethylation in *Xenopus* tadpole brain during metamorphosis. Poster presented at: 7th Great Lakes Nuclear Receptor Conference; 2016 October 19-20; Cleveland, OH.
- Raj S**, Bagamasbad PD, Bonett RM, Sachs L, Buisine N, Ruan Y, Ruan X, Knoedler J, Kyono Y, Denver RJ. Molecular mechanisms of hormone synergy at the Krüppel-like factor 9 nuclear receptor synergy module. Poster presented at: 3rd Biennial Conference of The North American Society for Comparative Endocrinology; 2015 Jun 21-25; Ottawa, Canada.
- Bagamasbad PD, Bonett RM, Sachs L, Buisine N, **Raj S**, Knoedler JR, Kyono Y, Ruan Y, Ruan X, Denver RJ. Deciphering the regulatory logic of an ancient, ultraconserved nuclear hormone receptor enhancer module. Poster presented at: Great Lakes Nuclear Receptor Conference; 2014 Oct 17-18; Madison, WI.

WORKSHOPS AND SYMPOSIA ATTENDED

- CENTRAL EUROPEAN UNIVERSITY – Budapest, Hungary
Summer University Program “The Quality of University Education” 2021
- ASSOCIATION OF AMERICAN COLLEGES AND UNIVERSITIES (AACU) – Chicago, IL
Integrating Social Issues Related to Demographic Categories into Science Biology and Social Sciences 2019
- FULBRIGHT UNIVERSITY VIETNAM – Ho Chi Min City, Vietnam
Writing to Learn, workshop by The Bard College Institute for Writing and Thinking (IWT) 2019
Engineering for Humanity (E4H) Course, workshop by Olin College 2019
Process Oriented Guided Inquiry Learning (POGIL) workshop 2018
- UNIVERSITY OF MICHIGAN – Ann Arbor, MI
Workshop on Faculty Recruitment to Enhance Diversity at Liberal Arts Colleges 2017

PUBLIC ENGAGEMENT AND VOLUNTEERISM

- FULBRIGHT UNIVERSITY VIETNAM – Ho Chi Min City, Vietnam
Volunteer Workshop Instructor for High School Students 2018 – Present
Volunteer Facilitator, Discovery-Based Learning Workshop for University / High School Teachers 2018
- UNIVERSITY OF MICHIGAN – Ann Arbor, MI
Student Blogger for Rackham Graduate School 2013 – 2015
Volunteer, Females Excelling More in Math, Engineering, and the Sciences (FEMMES) 2013

HONORS AND AWARDS

- UNIVERSITY OF MICHIGAN – Ann Arbor, MI
Rackham Dissertation Writing Grant 2017
Rackham Conference Travel Grant 2015
MCDB Graduate Student Travel Grant 2014, 2015
Rackham Pre-Candidate Research Grant 2014
- GREAT LAKES NUCLEAR RECEPTOR CONFERENCE
Outstanding Poster Presentation 2014, 2016