Aarya Venkat | Curriculum Vitae

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Education and training

University of Georgia — **2023**
Biochemistry and Molecular Biology (PhD) — Athens, GA
GPA: 3.9

University of California, San Diego — **2017**
Chemistry and Biochemistry (MS) — La Jolla, CA
GPA: 3.8

Graduate research assistant | PhD student — **2018–Present**
Biochemistry and Molecular Biology (Kannan lab) — University of Georgia

Graduate research assistant | MS student — **2015–17**
Chemistry and Biochemistry (Gilson lab) — University of California, San Diego

Internship — **2016**
Cytoscape - National Resource for Network Biology — San Francisco, CA
I worked with Dr. Scooter Morris to develop a Cytoscape application [PathInsight].

Fellowships and Awards

Fellowship	Amount	Sponsor	Year
ARCS Foundation Scholar[1]	$25,000	ARCS Foundation, Inc	2021-23
Future Faculty Fellowship[2]	$600	Center for Teaching and Learning, UGA	2019-20
Award			
Eriksson Lecture Scholarship[3]	$250	Dept. of Biochem and Mol. Bio, UGA	2023
ASBMB Travel Award	$1000	ASBMB Conference	2023
Research Poster Award	-	Society for Glycobiology	2022
Travel Award	$500	Society for Glycobiology	2022
Travel Award	$1000	University of Georgia, Graduate School	2022
Research Poster Award	-	Society for Glycobiology	2021
Travel Award	$500	Society for Glycobiology	2021
Travel Award	$450	University of Georgia, Graduate School	2021
Three Minute Thesis[4]	$500	People's Choice Award, UGA	2021
Outstanding Graduate Teaching Assistant[5]	-	Center for Teaching and Learning, UGA	2019
Outstanding Graduate Teaching Assistant	-	Center for Teaching and Learning, UGA	2018

[1] ARCS Foundation advances science and technology in the United States by providing awards to academically outstanding US citizens studying to complete degrees in STEM.

[2] Graduate school sponsored program that recruits and trains top performing teaching assistants from across campus in pedagogy and theory of learning at the university level.

[3] The Eriksson lecture is an invited talk given by top performing graduate students in the Department of Biochemistry, after publication of a first author paper. Speakers are also given a scholarship from the Karl-Erik L. Eriksson Memorial Endowment.

[4] This competition awards the capacity of PhD students to effectively explain their research in three minutes, in a language appropriate to a non-specialist audience.

[5] Given in recognition of teaching performance that ranks in top 10% of all graduate teaching assistants in the University.

Scholarly and Research Activities

Publications

Patents

1. Venkat, A., Castro, Y., and Manning, T. Using Computational QSAR Methods to Propose a New Group of Antibiotics for Dental Applications, U.S. Provisional Patent Appl. 62/359,638, July 22, 2016.

Papers (citations: 105) †indicates co-first authors.

1. Venkat, A., Taujale, R., and Kannan, N. (2023). Evolution of divergent fold-A glycosyltransferases. In Prep.
2. Venkat, A.†, Watterson, G.†, Byrne, D.†, O'Boyle, B., Shrestha, S., Fairweather, E., Bunn, C., Parikh, P., Yeung, W., Eyers, P., and Kannan, N. (2023). Evolutionary insights into the unique modes of auto-regulation in the DCLK family kinases. In Prep.
3. Aceil, J.†, Venkat, A.†, Pan, E., Kannan, N., and Avci, F. (2023). Prevalence and homology of the pneumococcal serine-rich repeat protein at the global scale. Microbiology Spectrum. Accepted.
4. Yeung, W., Zhou, Z., Mathew, L.G., Gravel, N., Taujale, R., Venkat, A., Lanzilotta, W., Li, S. and Kannan, N., (2023). Tree visualizations of protein sequence embedding space enable improved functional clustering of diverse protein superfamilies. Briefings in Bioinformatics, 24(1), p.bbac619.
5. Amos, R., Atmodjo, M., Huang, C., Gao, Z., Venkat, A., Taujale, R., Kannan, N., Moremen, K. and Mohnen, D., (2022). Polymerization of the backbone of the pectic polysaccharide rhamnogalacturonan I. Nature Plants, pp.1-15.
6. Venkat, A., Tehrani, D., Taujale, R., Yeung, W., Gravel, N., Moremen, K.W. and Kannan, N., (2022). Modularity of the hydrophobic core and evolution of functional diversity in fold A glycosyltransferases. The Journal of biological chemistry, 298(8), p.102212
7. Yeung, W., Kwon, A., Taujale, R., Bunn, C., Venkat, A. and Kannan, N., (2021). Evolution of functional diversity in the holozoan tyrosine kinome. Molecular Biology and Evolution, 38(12), pp.5625-5639.
8. Taujale, R., Soleymani, S., Priyadarshi, A., Venkat, A., Yeung, W., Kochut, K.J. and Kannan, N., (2021). GTXplorer: A portal to navigate and visualize the evolutionary information encoded in fold a glycosyltransferases. Glycobiology.
9. Huang, L.C., Taujale, R., Gravel, N., Venkat, A., Yeung, W., Byrne, D.P., Eyers, P.A. and Kannan, N., (2021). KinOrtho: a method for mapping human kinase orthologs across the tree of life and illuminating understudied kinases. BMC bioinformatics, 22(1), pp.1-25.
10. Gosztyla, M.L., Kwong, L., Murray, N.A., Williams, C.E., Behnke, N., Curry, P., ... Venkat, A., and Yamoah, M. A., (2021). Responses to 10 common criticisms of anti-racism action in STEMM. PLoS computational biology, 17(7), p.e1009141.
11. Zhang, A., Venkat, A., Taujale, R., Mull, J.L., Ito, A., Kannan, N. and Haltiwanger, R.S., (2021). Peters plus syndrome mutations affect the function and stability of human β1, 3-glucosyltransferase. Journal of biological chemistry, 297(1), p.100843.
12. Huang, L.C., Yeung, W., Wang, Y., Cheng, H., Venkat, A., Li, S., Ma, P., Rasheed, K. and Kannan, N., (2020). Quantitative Structure–Mutation–Activity Relationship Tests (QSMART) model for protein kinase inhibitor response prediction. BMC bioinformatics, 21(1), pp.1-22.
13. Taujale, R., Venkat, A., Huang, L.C., Zhou, Z., Yeung, W., Rasheed, K.M., Li, S., Edison, A.S., Moremen, K.W. and Kannan, N., (2020). Deep evolutionary analysis reveals the design principles of fold A glycosyltransferases. Elife, 9, p.e54532.
14. Venkat, A., (2017). PathInsight: A Novel Tool for Modeling Biomolecular Pathways. University of California, San Diego.
15. Venkat, A., Amerson, A.L. and Bielmyer-Fraser, G.K., (2016). Influence of water hardness on accumulation and effects of silver in the green alga, Raphidocelis subcapitata. Georgia Journal of Science, 74(2), p.5.
16. Kang, J., Park, S., Venkat, A. and Gopinath, A., (2015). Quantitative analysis of the trends exhibited by the three interdisciplinary biological sciences: biophysics, bioinformatics, and systems biology. Journal of microbiology & biology education, 16(2), pp.198-202.

Invited talks and guest lectures

1. A surprising modularity in the evolution of functional diversity of fold A glycosyltransferases. ASBMB Conference. Seattle Conference Center, **Invited Speaker** (2023)
2. Evolution of functional diversity of fold A glycosyltransferases. Eriksson Lecture. Complex Carbohydrate Research Center, **Invited Speaker** (2023)
3. Glycosyltransferases: Small variations contribute to large functions over evolutionary time. Complex Carbohydrate Research Center, **Invited Speaker** (2022)

4. AlphaFold2: protein structure-prediction in the modern era. BCMB3600. University of Georgia, **Guest Lecture** (2022)[6]
5. Modularity of the hydrophobic core and evolution of functional diversity in fold A glycosyltransferases. Southeast Enzyme Conference, **Invited Speaker** (2022)
6. Chemical equilibria. Chemistry 6B, UCSD, **Guest Lecture** (2017)[7]

Conferences and Presentations

1. Modular evolution of fold-A glycosyltransferases and new tools to analyze them. Society for Glycobiology. Fernandina Beach, FL (2022)
2. Modularity of the hydrophobic core and evolution of functional diversity in fold A glycosyltransferases. Glycoscience Training Program. Athens, GA (2022)
3. Modularity of the hydrophobic core and evolution of functional diversity in fold A glycosyltransferases. Society for Glycobiology. San Diego, CA (2021)
4. Mapping sequence-structure-function relationships in glycosyltransferases using deep learning models and data visualization tools. Society for Glycobiology. San Diego, CA (2021)
5. Origami: evolution's secret to the complexity of life. Three Minute Thesis. University of Georgia. Athens, GA. (2021)
6. Playground Learning: Team Learning and Gamification. USG Teaching & Learning Conference (cancelled due to covid-19). University of Georgia. Athens, GA. (2020)
7. Deep Evolutionary Analysis Reveals the Design Principles of Fold A Glycosyltransferases. Society for Glycobiology. Phoenix, AZ (2019)
8. Teaching and Laboratory Assistant Orientation. Delivered Lecture on Efficient Grading Practices. University of Georgia. Athens, GA (2018)
9. Teaching and Laboratory Assistant Orientation. "Teaching Tips" Q&A Panelist. University of Georgia. Athens, GA (2018)
10. Does Competition Enhance Learning Over a Relaxed Guided Lesson? Teaching Methods Poster Presentation. University of California, San Diego (2017)
11. Influence of Water Hardness on Accumulation and Effects of Silver in the Green Alga, Raphidocelis subcapitata. Valdosta State University. Valdosta, GA (2015)
12. Using Computational QSAR Methods to Propose a New Group of Antibiotics for Dental Applications. Valdosta State University. Valdosta, GA (2015)
13. Project Based Learning: Connecting Learners through Guided Class Projects in the Sciences. Valdosta State University. Valdosta, GA (2015)
14. Project Based Learning: Implanted Glucose Sensor and Release Mechanism. Valdosta State University. Valdosta, GA (2015)

Selected Press Coverage

1. **Seven PhD students named 2021 ARCS Scholars (2021):** https://research.uga.edu/news/seven-phd-students-named-2021-arcs-scholars/
2. **Department recognition for ARCS Foundation Award (2021):** https://www.bmb.uga.edu/news/stories/2021/aarya-venkat-receives-2021-22-arcs-foundation-award
3. **Winning the 3 Minute Thesis (2021):** https://news.uga.edu/10th-annual-three-minute-thesis-competition/
4. **3 Minute Thesis (2021):** https://www.bmb.uga.edu/news/stories/2021/congratulations-aarya-and-brittany
5. **Anti-Racism in STEM (2020):** https://werepstem.com/2020/09/04/they-wrote-the-guide-on-how-to-respond-to-criticisms-of-anti-racism-action-in-stem-heres-why-they-did-it/
6. **Future Faculty Fellows (2019):** https://www.bmb.uga.edu/news/stories/2019/congratulations-aarya-venkat

[6] I gave a lecture on state-of-the-art protein structure-prediction methods, including AlphaFold2. I developed a case study assignment on the usage of AlphaFold2, in combination with other bioinformatics tools (BLAST, Swissprot, and Uniprot), for students to analyze predicted structures and generate hypotheses about their function, supported by existing literature.

[7] I gave a lecture on chemical equilibria to 400 undergraduate students. This included addressing concerns on equilibrium, such as the application of Raoult's law. I developed laymen explanations for how changes in the mole fraction of a solution affects vapour pressure resulting in boiling point elevation/freezing point depression and walked students through solving common equilibrium questions on the ACS general chemistry exam.

Teaching

Guest Lectures

1. AlphaFold2: protein structure-prediction in the modern era. BCMB3600. University of Georgia, **Guest Lecture** (2022).
2. Chemical Equilibria. Chemistry 6B, UCSD, **Guest Lecture** (2017)

Classes taught

Instructor Rating: 4.4 for undergraduates (Weighted Average, 5=best)

Course	Class Type	Assignment	University	Level	Year
BCMB3600	Classroom	Guest Lecturer	University of Georgia	undergraduate	2022
BCMB3600	Classroom	Grader	University of Georgia	undergraduate	2019-21
BCMB3100	Classroom	Grader	University of Georgia	undergraduate	2019-20
BIOL1103	Lab	Instructor of Record	University of Georgia	undergraduate	2019
CHEM1212	Lab	Teaching Assistant	University of Georgia	undergraduate	2018
CHEM1211	Lab	Teaching Assistant	University of Georgia	undergraduate	2018
CHEM6B	Classroom	Guest Lecturer	University of California, San Diego	undergraduate	2017
CHEM6B	Classroom	Teaching Assistant	University of California, San Diego	undergraduate	2017

Mentorship

***** indicates those I am currently mentoring.

Name	Time mentored	Level	Notable Achievements under Mentorship
Catalina Ney*	6 months	Undergraduate	-
Nathan Kleber*	1 year	Undergraduate	-
Grace Watterson*	2.5 years	Undergraduate	Invited speaker at 88th Harden Conference
Mariah Salcedo*	1.5 years	PhD student	ARCS Foundation Scholar
Nolan Kemppinen	3 years	PhD student	-
Brady O'Boyle	2.5 years	PhD student	-
Nathan Gravel	2.5 years	PhD student	-
Daniel Tehrani	2 years	PhD student	-
Priyanka Parikh	1 year	Undergraduate	-
Swati Bala	6 months	Undergraduate	-
Claire Bunn	4 years	Undergraduate	Goldwater Scholar, Gates-Cambridge Fellowship MD/PhD at Cambridge University
Niral Thaker	3 years	Undergraduate	MD student at Medical College of Georgia
Max Kuhr	1 year	Undergraduate	-
Ganesh Prabakaran	6 months	Undergraduate	-
Jamini Patel	6 months	Undergraduate	-
Raga Dasana	2 years	high school	Accepted as undergraduate at UNC Chapel Hill
Victor Valbuena	3 months	high school	Accepted as undergraduate at Georgia Tech
PhD Rotation Students	24 weeks	PhD students	-

Service

Service to Profession

Professional Memberships

Organization	Year(s)	Position
American Society for Biochemistry and Molecular Biology	2022-	Member
ARCS Foundation	2021-	Scholar
Society for Glycobiology	2020-	Member
American Association for the Advancement of Science	2020-	Member
Future Faculty Fellows Program (UGA)	2019-20	Alumnus

Workshops and Symposiums

Program Name	Location	Year(s)	Role
Protein Engineering Symposium	University of Georgia	2022	Organizer
Unfolded Protein Response Symposium	University of Georgia	2020	Chair
Writing a Diversity Statement	University of Georgia	2020	Workshop leader
Developing Fair Grading Strategies	University of Georgia	2020	Workshop leader
Spring Teaching Symposium	University of Georgia	2020	Organizer
Cancer Immunotherapies Symposium	University of Georgia	2019	Organizer

Service to University

Service	Year(s)	Institution	Role
Graduate Retention and Inclusion Grant	2022-23	BCMB department, UGA	Mentoring Committee[8]
Invited Professor David Baker to give a talk	2022	BCMB department, UGA	Host
Science Outreach and Social Media Release	2018-23	Kannan Lab	Coordinator
Biochemistry Graduate Students Association (BGSA)	2020-22	BCMB department, UGA	Faculty Liaison
Biochemistry Symposium Committee	2018-22	BCMB department, UGA	Chair/Organizer/Advisor
Invited Professor Ken Dill to give a talk	2021	BCMB department, UGA	Host
Invited Professor Susan Marqusee to give a talk	2020	BCMB department, UGA	Host

Service to Community

2022 College applications FAQ - Conducted a zoom-based session discussing common questions about college applications focused on helping underrepresented students and first-generation college students.

2020–22 National History Day - Judged Performances and Documentaries for middle and high school students.

2021–22 Sweet Olive Farm - Managed young volunteers at a local animal rescue.

2019–20 Teaching Leadership - Developed a curriculum on the roles of ethics and empathy in good leadership.

2017–20 Science Olympiad Lab Manager - Set up chemistry labs and ensured lab safety protocols were followed.

2017–20 Computer Literacy - Established weekend computer literacy courses at the Athens-Clarke county library.

2015–16 Outreach Advancement Towards Hope (OATH) - UCSD organization helping the underserved in downtown San Diego through medical outreach, performing medical screenings with a certified physician.

2014–15 Resource and Insurance Navigator Group (RING) - health insurance outreach organization focused on helping the underserved sign up for health care under the Affordable Health Care act.

[8] The graduate retention and inclusion grant is an internal grant written by UGA PhD students in the department of Biochemistry and Molecular Biology (BCMB) to improve student success in the BCMB program. My role in the mentorship committee is twofold: The first is in developing a "survival guide" that compiles tips and advice from previously successful graduate students. The second role is in coordinating new PhD students with senior PhD student mentors to improve collegiate relationships post-pandemic and provide communal support for PhD success.