

# Aarya Venkat | Curriculum Vitae

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## Education and training

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University of Georgia Biochemistry and Molecular Biology (PhD) GPA: 3.9	2023 Athens, GA
University of California, San Diego Chemistry and Biochemistry (MS) GPA: 3.8	2017 La Jolla, CA
Graduate research assistant   PhD student Biochemistry and Molecular Biology (Kannan lab)	2018–Present University of Georgia
Graduate research assistant   MS student Chemistry and Biochemistry (Gilson lab)	2015–17 University of California, San Diego
Internship Cytoscape - National Resource for Network Biology I worked with Dr. Scooter Morris to develop a Cytoscape application [PathInsight].	2016 San Francisco, CA

## Awards and Honors

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Eriksson Scholarship Department of Biochemistry, UGA Given in recognition of top performing graduate students in the Department of Biochemistry. Speakers are given a scholarship from the Karl-Erik L. Eriksson Memorial Endowment. <b>Award: \$250.</b>	2022 Athens, GA
Travel Awards Society for Glycobiology Conference Total Award: \$1000.	2021 & 2022 San Diego, CA
Travel Awards University of Georgia Award: \$1450.	2021 & 2022 Athens, GA
Poster Award Society for Glycobiology Conference Given in recognition of the top research presentations by graduate students and postdocs.	2021 San Diego, CA
ARCS Foundation Scholar University of Georgia ARCS Foundation advances science and technology in the United States by providing awards to academically outstanding US citizens studying to complete degrees in STEM. <b>Award: \$25,000.</b>	2021-23 Athens, GA
Three Minute Thesis People's Choice Award 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. <b>Award: \$500.</b>	2021 Athens, GA
Future Faculty Fellowship Future Faculty Fellows Program 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. <b>Award: \$600.</b>	2019-20 Athens, GA
Outstanding Graduate Teaching Awards Center for Teaching and Learning Given in recognition of teaching performance that ranks in top 10% of all graduate teaching assistants in the University.	2018 & 2019 Athens, GA

# Scholarly and Research Activities

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## Publications

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### 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: 89) \*indicates co-first authors.

1. Venkat, A., Taujale, R., Ney, C. C., and Kannan, N. (2022). Evolution of Pseudoglycosyltransferases. In Prep.
2. Watterson, G.\*, Venkat, A.\*, Byrne, D.\*, O'Boyle, B., Shrestha, S., Fairweather, E., Bunn, C., Parikh, P., Yeung, W., Eysers, P., and Kannan, N. (2022). 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. (2022). Prevalence and Homology of the Pneumococcal Serine-Rich Repeat Protein at the Global Scale. Under Review.
4. Yeung, W., Zhou, Z., Mathew, L.G., Gravel, N., Taujale, R., Venkat, A., Lanzilotta, W., Li, S. and Kannan, N., (2022). Tree visualizations of protein sequence embedding space enable improved functional clustering of diverse protein superfamilies. Submitted.
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. Accepted.
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., Eysers, 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 STEM. 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  $\beta$ 1, 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

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1. A surprising modularity in the evolution of functional diversity of fold A glycosyltransferases. Eriksson Lecture. Complex Carbohydrate Research Center, **Invited Speaker** (2022)<sup>1</sup>
2. Glycosyltransferases: Small variations contribute to large functions over evolutionary time. Complex Carbohydrate Research Center, **Invited Speaker** (2022)

<sup>1</sup>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.

3. AlphaFold2: protein structure-prediction in the modern era. BCMB3600. University of Georgia, **Guest Lecture** (2022)<sup>2</sup>
4. Modularity of the hydrophobic core and evolution of functional diversity in fold A glycosyltransferases. Southeast Enzyme Conference, **Invited Speaker** (2022)
5. Chemical equilibria. Chemistry 6B, UCSD, **Guest Lecture** (2017)<sup>3</sup>

## Conferences and Presentations

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1. Evolutionary origins and pseudogenization of glycosyltransferases. 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

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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>

<sup>2</sup>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.

<sup>3</sup>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: 4.6 for undergraduates (Weighted Average, 5=best)				
Class	Assignment	University	Level	Year
BCMB3600	Instructor of Record	University of Georgia	undergraduate	2022
BCMB3600	Grader	University of Georgia	undergraduate	2019-21
BCMB3100	Grader	University of Georgia	undergraduate	2019-20
BIOL1103	Instructor of Record	University of Georgia	undergraduate	2019
CHEM1212	Teaching Assistant	University of Georgia	undergraduate	2018
CHEM1211	Teaching Assistant	University of Georgia	undergraduate	2018
CHEM6B	Teaching Assistant	University of California, San Diego	undergraduate	2017

## Mentorship

Name	Time mentored	Current location	Level	Grad. date
Catalina Ney	2 months	University of Georgia	lab undergrad	2023
Mariah Salcedo	1.5 years	University of Georgia	lab PhD student	Present
Nathan Kleber	1 year	University of Georgia	lab undergrad	2025
Daniel Tehrani	2 years	University of Georgia	PhD student	Present
Brady O'Boyle	2 years	University of Georgia	lab PhD student	Present
Grace Watterson	2 years	University of Georgia	lab undergrad	2024
Nolan Kemppinen	3 years	University of Georgia	lab PhD student	Present
Priyanka Parikh	<1 year	University of Georgia	lab undergrad	2023
Swati Bala	1 year	University of Georgia	undergraduate	2023
Nathan Gravel	2 years	University of Georgia	lab PhD student	Present
Ehsan Suez	6 weeks	University of Georgia	ILS rotation student	Present
Donovan Cantrell	3 years	University of Georgia	PhD student	Present
Claire Bunn	3.5 years	Cambridge University	lab undergrad	2022
Niral Thaker	3 years	Medical College of Georgia	lab undergrad	2021
Max Kuhr	1 year	University of Georgia	lab undergrad	2021
Ganesh Prabakaran	1 year	University of Georgia	lab undergrad	2021
Jamini Patel	6 months	University of Georgia	undergraduate	2021
Raga Dasana	2 years	UNC Chapel Hill	High school student	2020
Victor Valbuena	3 months	Georgia Tech	High school student	2019

# Service

## Service to Profession

- 2022 Protein Engineering Symposium - Organizer. University of Georgia
- 2021- Scholar, ARCS Foundation
- 2021- Member, Society for Glycobiology
- 2020 Unfolded Protein Response Symposium - Chair. University of Georgia
- 2020 Writing a Diversity Statement - GradTeach Workshop - Workshop leader
- 2020 Spring Teaching Symposium - Workshop leader
- 2020 Spring Teaching Symposium - Organizer. University of Georgia
- 2020- Member, American Association for the Advancement of Science
- 2019 Cancer Immunotherapies Symposium - Organizer. University of Georgia

## Service to University

- 2022-23 Mentoring Committee, Graduate Retention and Inclusion grant

- 2021      Invited Professor Ken Dill to give a talk on the driving forces of cell homeostasis and evolution
- 2020      Invited Professor Susan Marqusee to give a talk on protein folding and turnover
- 2018–23   Science Outreach and Social Media Coordinator, Kannan Lab
- 2020–22   Biochemistry Graduate Students Association (BGSA)
- 2018–22   Chair, UGA Biochemistry Symposium Committee
- 2019–20   Fellow, Future Faculty Fellow, University of Georgia

## 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.