Aarya Venkat

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EDUCATION

UNIVERSITY OF GEORGIA
PhD Biochemistry
ARCS Foundation Scholar
Future Faculty Fellow
Dec 2023

UC, SAN DIEGO
MS Chemistry
June 2017

SKILLS

PROGRAMMING
Python • CSS • Git • Bash • Docker • Kubernetes • Argo Workflows • Nextflow • Cloud Computing (AWS, GCP)

BIOINFORMATICS
Sequence Analysis
Metagenomic sourcing • Sequence alignment • Intron/Exon analysis • Clustering • ESM inference
Molecular Dynamics
MDAnalysis • Amber suite • GROMACS • Schrodinger • Forcefield parameterization
Molecular Modeling
Structure-prediction • Rosetta • Molecular Docking • VMD • PyMOL • Homology modeling • RFDiffusion
Deep Learning
Explainable AI • Protein language models • Dataset preparation • App/Tool development • Predictive modeling

RESEARCH
Writing • Editing • Analytical skills • Data Visualization • Figure generation • Illustrator • Multivariate Statistical Analysis • Making presentations

MISCELLANEOUS
Leadership • Public speaking • Documentation • Systems administration

AWARDS

2023 | Eriksson Lecture Scholarship
2023 | ASBMB Conference Travel Award
2022 | Glycobiology Poster Award
2022 | Glycobiology Travel Award
2021 | Glycobiology Poster Award
2021 | Glycobiology Travel Award
2021 | UGA Travel Award
2021 | ARCS Foundation Scholar
2021 | Three Minute Thesis Award

RECENT EMPLOYMENT HISTORY

GINKGO BIOWORKS, INC | Protein Engineer III
Dec 2023 – current | Boston, MA

- Performed protein engineering campaigns by combining molecular docking, modeling, inference with evolutionary models like ESM2 and evcouplings, and metagenomic sourcing approaches to design and enhance specific or multiple protein function objectives like specificity, thermostability, activity, and fidelity in high-budget contracts.
- Engaged and led customer-facing meetings, developing and explaining the research performed, the benefits, risks, and expectations for future research directions.
- Developed custom deep learning models fine-tuned from ESM2 and other models to build custom enzyme models.
- Developed docker pipelines on Kubernates using Argo workflow for tools like RFDiffusion-AA, proteinMPNN, and propietary tools to be used for large-scale design of proteins.
- Subject matter expert and tech liaison for multiple projects involving AI, protein variant design, or general computational biology expertise.

UNIVERSITY OF GEORGIA | Graduate Research Assistant
July 2018 – Dec 2023 | Athens, GA

- Performed bioinformatics and evolutionary analyses, including molecular dynamics, phylogeny, modeling, quantum chemistry, and sequence analyses.
- Developed deep learning models and tools to classify enzyme function.
- Maintain data storage, equipment, purchase orders, protocol documentation.
- Authored over 17 manuscripts for publication, with key involvement in writing, editing, data generation, analysis, visualization, and funding.

SELECTED PUBLICATIONS

Papers (Total: 21) (citations: 200) (H-index: 8)

Venkat, A. (2025). GapClean, a tool for cleaning and improving comprehension of protein sequence alignments. In Prep.

Venkat, A., et al. (2025). Glydentify, a deep learning tool for classification of glycosyltransferase function. In Prep.

Venkat, A. et al. (2023). Mechanistic and evolutionary insights into isoform-specific 'supercharging' in DCLK family kinases. eLife.

Aceil, J.†, Venkat, A.†, et al. (2023). Prevalence and homology of the pneumococcal serine-rich repeat protein at the global scale. Microbiology Spectrum.

Meng, Y. et al. (2023). Phosphorylation-dependent pseudokinase domain dimerization drives full-length MLKL oligomerization. Nature Communications

Venkat, A., et al., (2022). Modularity of the hydrophobic core and evolution of functional diversity in fold A glycosyltransferases. Journal of Biological Chemistry.

Taujale, R., Venkat, A., et al. (2020) Deep evolutionary analysis reveals the design principles of fold A glycosyltransferases. eLife.

INVITED TALKS

2023

Evolution of fold-A glycosyltransferases and GTXplorer, a new tool for comparative glycomics. ASBMB Conference. Seattle Conference Center

Evolution of functional diversity of fold A glycosyltransferases. Eriksson Lecture. Complex Carbohydrate Research Center

2022

AlphaFold2: protein structure-prediction in the modern era. BCMB3600. University of Georgia

Modularity of the hydrophobic core and evolution of functional diversity in fold A glycosyltransferases. Southeast Enzyme Conference

2017

Principles of chemical equilibria, UC, San Diego

WORKSHOPS AND SYMPOSIA

2023

AI and Deep Learning, Applications in Bioinformatics

2022

Protein Engineering Symposium - Chair

2021

Unfolded Protein Response Symposium - Chair

2020

Writing a Diversity Statement - GradTeach Workshop - Workshop leader, 2020

Spring Teaching Symposium - Workshop leader

Spring Teaching Symposium - Organizer

2019

Cancer Immunotherapies Symposium - Organizer

SERVICE

NATIONAL HISTORY DAY JUDGE

2020-2022 | Athens, GA

Judged Performances and Documentaries for middle school and high school students. Provided critiques to aid them in state and national competitions.

SCIENCE OLYMPIAD LAB MANAGER

2017-2020 | Athens, GA

Aid in setting up Chemistry and Forensic labs for high school Science Olympiad. Ensure lab safety protocols are followed as students compete.

PRESENTATIONS/POSTERS

2023

Glydentify, a deep learning tool for classification of glycosyltransferase function. Society for Glycobiology. Big Island, HI

2022

Modular evolution of fold-A glycosyltransferases and new tools to analyze them. Society for Glycobiology. Fernandina Beach, FL

Modularity of the hydrophobic core and evolution of functional diversity in fold A glycosyltransferases. Glycoscience Training Program. Athens, GA

2021

Modularity of the hydrophobic core and evolution of functional diversity in fold A glycosyltransferases. Society for Glycobiology.

2020

Playground Learning: Team Learning and Gamification. USG Teaching & Learning Conference (Cancelled: COVID-19)

Unfolded Protein Response. Biochemistry Symposium Chair. University of Georgia.

2019

Deep Evolutionary Analysis Reveals the Design Principles of Fold A Glycosyltransferases. Glycobiology Conference Poster. PI: Natarajan Kannan, UGA

Cancer Immunotherapies. Biochemistry Symposium Host. University of Georgia.

Teaching and Laboratory Assistant Orientation. Delivered Lecture on Efficient Grading Practices. University of Georgia.

2018

Teaching and Laboratory Assistant Orientation. "Teaching Tips" Q&A Panelist. University of Georgia.

2017

PathInsight: A Novel Tool for Modeling Biomolecular Pathways. Thesis Defense. UCSD.

Guest Lecture on Chemical Equilibrium. Chemistry 6B, UCSD.

2016

Does Competition Enhance Learning Over a Relaxed Guided Lesson? Teaching Methods Poster Presentation. Natural Sciences Building, UCSD.