**SHRI VISHALINI RAJARAM**

*Human Toxicology | Oral Microbiome | Computational Biology | Multi-Omics*

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## EDUCATION

**Doctor of Philosophy – Human Toxicology**  **08/2022 - Expected 05/2027**

The University of Iowa, Iowa City, IA, United States (GPA – 4.08)

**Master of Technology - Computational Biology**  **09/2018 - 05/2020**

Alagappa College of Technology, Anna University, Chennai, India (GPA – 3.94)

**Bachelor of Technology - Genetic Engineering**  **08/2013 - 05/2017**

Bharath Institute of Higher Education and Research, Chennai, India (GPA – 3.8)

## PROFESSIONAL EXPERIENCE

**Graduate Research Assistant –** College of Dentistry, The University of Iowa, IA, USA **08/2022 to Present**

## Coordinate and contribute to 12 concurrent computational biology projects, collaborating with cross-institutional teams (State Hygienic Laboratory & College of Dentistry) to deliver scalable and reproducible analysis solutions.

## Analyze 10 metagenomic, 10 metatranscriptomic, and two metaproteomic datasets (~17 TB total), profiling bacteria, fungi, viruses, and archaea across multi-kingdom microbiomes.

## Build and deploy containerized, reproducible pipelines (R, Python, Bash) orchestrated with Nextflow and Snakemake, optimized for high-throughput processing on the Argon HPC (SGE).

## Benchmark 22 differential abundance/expression methods, from conventional count-based approaches to advanced longitudinal and zero-inflated models, establishing reproducibility standards for large-scale microbial analyses.

## Develop a machine learning framework that integrates six feature selection strategies with seven classification algorithms, containerized with Docker/Singularity for reproducible deployment and performance benchmarking.

## RESEARCH INTERNSHIPS

## PUBLICATIONS

1. Sanyal, P., Uppada, J., Sinha, S., Bhat, Y., Khan, S., **Rajaram, S.V.,** Albert Arokiyaraj, E., Jhingan, G.D., Agarwal, N., Samal, A., Nandicoori, V.K. (2025). Sec and Tat mediated secretion safeguards Mycobacterium tuberculosis membrane homeostasis. bioRxiv preprint (Cold Spring Harbor Laboratory). https://doi.org/10.1101/2025.09.04.674216
2. Shen, Y., **Rajaram, S. V.,** Wang, W., & Zeng, E. (2025). DeepBioSim: Efficient and Versatile Methods for Microbiome Data Simulation with Minimal Statistical Assumptions. bioRxiv preprint (Cold Spring Harbor Laboratory). https://doi.org/10.1101/2025.08.21.670443
3. **Rajaram, S. V.,** Singh, P., & Zeng, E. (2025). Metatranscriptomic analysis reveals toxin-antitoxin system shifts in caries-associated oral microbiomes. bioRxiv preprint (Cold Spring Harbor Laboratory). https://doi.org/10.1101/2025.08.07.669164
4. Sahoo, A. K., Vivek-Ananth, R. P., Chivukula, N., **Rajaram, S. V.,** Mohanraj, K., Khare, D., ... & Samal, A. (2023). T9GPred: A Comprehensive Computational Tool for the Prediction of Type 9 Secretion System, Gliding Motility, and the Associated Secreted Proteins. ACS omega, 8(37), 34091-34102.
5. **Shri Vishalini R**\*, Dr P Rajasulochana: A Novel Approach to Synthesis and Characterization of Silver Nano Particles of Feverfew Seeds. J. Chem. Pharm. Res., 2016, 8(1):690-697.

## CONFERENCES

***Oral Presentations***

1. **2nd Place Award** for Oral presentation on **“Gene activity changes in oral bacteria during dental caries and treatment”** in the Jakobsen Graduate Research Showcase 2025**,** University of Iowa, Iowa City, IA (March 2025)
2. **I Place Award** for Oral presentation on “**Functional Shifts of Toxin-Related Microbial Genes in Dental Caries**” in the 2025 James S. and Janice I. Wefel Memorial Fund Graduate/Post-Doctoral Competition at the AADOCR Iowa Section Annual Meeting, University of Iowa, Iowa City, IA (February 2025)
3. Oral presentation on “**Investigating the Changes of Toxin-Related Gene Expression in the Oral Metatranscriptome of Dental Caries**” in Central States – Midwest Regional Chapters of Society of Toxicology, 2024 Annual Meeting, AI tools in toxicology, Iowa City, IA (October 2024)
4. Oral Presentation on “**Multi-omics comparison of bacteria, fungi, and viruses in oral microbiome**” in 2024 IADR/AADOCR/CADR General Session and Exhibition, New Orleans, LA (March 2024)
5. **I Place Award** for Oral presentation on “**Multi-omics comparison of Oral Mycobiome**” in the 2024 Max Smith Graduate/Post-Doctoral Competition at the AADOCR Iowa Section Annual Meeting, University of Iowa, IA (February 2024)

***Poster Presentations***

1. Poster Presentation on “**Comprehensive evaluation of differential abundance methods for multi-omics oral microbiome data**” in American Society of Microbiology - Conference on Rapid Applied Microbial Next-Generation Sequencing and Bioinformatic Pipelines (ASM NGS), Washington, D.C. (October 2024)
2. Poster Presentation on “**Gene expression data and machine learning approaches unveils drug-induced liver injury (DILI) biomarkers**” in Central States Regional Chapter of Society of Toxicology, 2023 Annual Meeting, One World, One Health, One Toxicology, Lincoln, NE (October 2023)
3. Poster Presentation on **“An (incomplete) blueprint on the protein secretion machinery in *Mycobacterium tuberculosis”*** in *Mycobacterial* heterogeneity and host tissue tropism at India | EMBO symposium 2020, New Delhi, India (February 2020)
4. Poster Presentation on **“Identification of pathways to be targeted for diffuse type Gastric tumors with dysregulated Extracellular Matrix”** at 49th Aqua-Terr Annual Conference on Biological Sciences at Madurai Kamaraj University, Madurai, India (February 2018)

***Attended***

1. **Festival of Genomics and BioData**, Boston, MA (June 2025)
2. **Central States Chapter of the Society of Toxicology (CS-SOT)** annual meeting, Kansas City, KS (October 2022)
3. **AVIDADHAM’19- Metamorphosis from academia to industrialization,** an International Conference organized by the Center for Biotechnology, Anna University, Chennai (February 2019)
4. Symposium on **Genetic Diseases**: From Mendelian to Malignancies**,** Indian Institute of Technology (IIT-Madras), Chennai, India (August 2015)
5. **Indian** **Genetics Congress**, SRM University, Chennai, India (March 2015)

## GRANTS AND FELLOWSHIPS

**ACT Graduate Scholars Fellowship - Graduate College, University of Iowa 08/2025 – 05/2027**

* Competitive fellowship supporting graduate researchers in translational science; $27,500 stipend + $1,500 professional development.

**Graduate Teaching Fellowship – Center for Teaching, University of Iowa   08/2025 – 05/2026**

* Evidence-based pedagogy fellowship with SoTL training and teaching-as-research project “The Art of Teaching Across Disciplinary Borders”; $750 per semester stipend for participation and research.

**James S. and Janice I. Wefel Memorial Research Award for Cariology – University of Iowa**

* $1,600 award supporting conference travel and research proposal “Functional identification of toxin-related microbial genes from oral metatranscriptomics.” **07/2025 – 12/2026**
* $2,500 award supporting conference travel and research proposal “Identifying prognostic biomarkers in multi-omics and cross-kingdom microbial interactions.” **07/2024 – 12/2025**

## PROFESSIONAL CERTIFICATIONS

## TEACHING EXPERIENCE

PRACTICUM

PEER MENTOR

GRADUATE TEACHING FELLOWSHIP

CIRTL CERTIFICATIONS

## SERVICE TO THE PROFESSION

## JOURNAL REVIEWER

## CONFERENCE/WORKSHOP ORGANIZATION

## AWARD REVIEWER

## DEPARTMENTAL AND UNIVERSITY LEVEL SERVICE

## UNIVERSITY COMMITTEES AND PANELS

## STUDENT ORGANIZATIONS

## COMMUNITY INVOLVEMENT AND OUTREACH

## PROFESSIONAL SOCIETY MEMBERSHIPS