

Neha Sindhu

BIOINFORMATICS · GENOMICS DATA ANALYTICS · DOCTORAL FELLOWSHIP FOR EXCELLENCE RECIPIENT

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Professional Summary

Bioinformatics Ph.D. candidate experienced with large-scale biological datasets. 4 year of experience in independently analyzing high-throughput NGS data, **bulk and single-cell omics**, multi-omics, and more. Solid background in mathematics, statistics, machine learning as well as cancer and molecular biology. Active in several leadership and community service roles.

Education

PhD, Bioinformatics Data Science: University of Delaware.

2021 - Present

- **Award:** Doctoral Fellowship for Excellence from the Graduate College

BS-MS Dual Degree, Mathematics with Minor in Biology: Indian Institute of Science Education and Research (IISER), Thiruvananthapuram, India.

- **Awards:** Silver Medal from the School of Mathematics, INSPIRE-SHE Scholarship from the Government of India

Skills

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| Bioinformatics and NGS | Genomics, Transcriptomics (Bulk and single-cell RNAseq), Multi-omics Integration, Proteomics, DNA-seq, ATAC-Seq, STRING, Cytoscape. |
| Programming | R, Python, HPC Computing, BASH, MATLAB, Perseus, GitHub Version Control, Linux, SQL, Cloud Computing, SAS. |
| AI/Machine Learning | Statistics, Big Data Analytics, Databases, Data Mining, Regression and Classification, Neural Networks. |
| Laboratory Techniques | qRT-PCR, Sterile Techniques, Western Blotting, DNA/RNA Extraction, Mammalian, Bacterial, and Insect Cell-Culture. |

Relevant Research Experience

Multi-Omics Integration to Identify Targets and Substrates of ADAM9 in Colon Cancer Cells.

Research Assistant | University of Delaware

- Applied genomic technologies to predict the substrates and targets of ADAM9 metalloproteinase and understand its mechanism using colon cancer cell lines.
- Leveraged sequencing methods including differential expression analysis and machine learning to integrate RNAseq, Cellular Proteomics, and Secretomics Datasets.
- Applied regression models to predict 176 transcriptional and 1041 post-transcriptional targets of ADAM9, including 188 substrates with ranked levels of confidence.
- Employed pathway enrichment analysis to validate two downstream pathways.
- Developed a computational and statistical proteotranscriptomics method applicable to different membrane proteins with minimal modifications.

Single Cell RNAseq Analysis to Study Neural Crest Stem Cells at High Sequencing Depth.

Research Assistant | University of Delaware

- Designed and executed 15 single-cell RNAseq analyses (cumulatively 2,73,099 cells) to study the gene regulatory networks in neural crest migration during embryonic development.
- Performed AI-based and classical cell type annotations, integration and trajectory analysis, and data visualization with interpretation of the single cell RNAseq data to trace the differentiation of neural crest cell types.

Drug-Seq Support for Collaborating Experimental Labs.

Research Assistant | University of Delaware

- Paired-design RNAseq to study the effect of drug treatment on stag2 mutant mouse models.
- Drug sensitivity test for novel anti-osteoarthritis drugs using RNAseq of bovine cartilage.

Algorithm Development to Estimate COVID-19 Transmission

Research Assistant | University of Delaware

- Developed models to integrate recursive algorithms with predictive analytics for disease transmission. Used this to model the spread of COVID-19 in Delaware.

Predictive Model to Optimize Chemotherapy Regimen to Minimize Treatment Resistance

Masters Thesis | Indian Institute of Science Education and Research

- Developed a model for a chemotherapy regimen that optimizes cancer drug response.

Publication

- **Co-first author:** An integrative proteotranscriptomics approach reveals new ADAM9 substrates and downstream pathways. Congyu Lu, Xiaolu Xu, Neha Sindhu, Jessica Rainey, Shawn W. Polson, Jing Qiu, Shuo Wei. doi:<https://doi.org/10.1101/2024.10.01.616047>.

Conferences and Presentations

- **Oral Presentations**
 - Two talks in Seminar Series hosted by UD's Center for Bioinformatics and Computational Biology.
 - College of Engineering Recruitment Event, October 2024.
- **Poster Presentations**
 - Mid-Atlantic Bioinformatics Conference. October 2023, October 2024.
 - North East Regional IDeA Conference (NERIC). August 2023.

Certificates and Affiliations

- Mastering Single-Cell RNAseq Data Analysis with Cellenics, Bioimage Online Course.
- **Google Project Management** Professional Certificate, by Google on Coursera
- 3D Illustration for Science Communication Using Blender from SciDart Academy.
- Leadership Certificate for Graduate Students, UD Professional and Continuing Studies.

Leadership Experience

- **Member, International Student Advisory Committee (ISAC)**, UD. Summer 2024-Present
 - Acted as a liaison between the International Student Community and the Officials at the University.
 - Volunteered in organizing student engagement events.
- **President, Bioinformatics Student Association (BiSA)**, Spring 2023-Summer 2024
 - Collaborated with Data Carpentry to organize a **genomics workshop** for 42 graduate students.
 - Organized Data Skills Bootcamp that introduced bioinformatics to over 50 non-data scientists.
 - Organized two career panels.
 - Started a mentorship program for incoming students.
- Participated in **Eli Lilly Discovery Day** 2023, one of the Ph.D. students selected for targeted leadership development in Advanced Analytics and Data Science (March 2023).
- Vice-President, BiSA (Fall 2022), Communications Coordinator, BiSA (Spring 2022).
- Member, the **Diversity Committee, Graduate Student Government** of UD. (Fall 2022).

Teaching and Mentoring Experience

Teaching Assistantships BINF644 - Bioinformatics (Spring 2023), Data Skills Bootcamp (Summer 2023), Summer Undergraduate Workshop by CBCB (Summer 2024), Genomics workshop by Data Carpentry (August 2024).

Mentorships at the University Mentor in the BiSA Mentorship Program (2023, 2024)
Mentored an undergraduate student researcher in Wei Lab,
Trained a first-year Bioinformatics Ph.D. student in a collaborating lab.

Community Volunteer Mentoring Gave a talk at the Newark Charter Senior High School on -omics technologies.
Demonstrated basic genetics at two STEM outreach events for middle schoolers by Project Brainlight