Nischal Bhandari

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GitHub Portfolio

Education

Ramapo College of New Jersey, Mahwah, NJ
B.S. in Bioinformatics and Data Science, 2020-2024
Capstone Project: *Investigating the Role of Relative Usage of Synonymous Codons in Breast Cancer Metastasis: tRNA and miRNA perspective*

Technical Skills

Wet Lab: PCR, SDS-PAGE, Spectrophotometry, Cell Culture, Bacterial Transformation, Gel Electrophoresis
Programming & Tools: Python, R, SQL, Bash, Git, Docker, Singularity, Nextflow, Snakemake
Genomics/Bioinformatics: Seurat, DESeq2, edgeR, Scanpy, CIBERSORTx, ShinyApps

Research Experience

Computational Biologist, Westcott Lab *Jun 2024 – Present*
Cold Spring Harbor Laboratory, NY

- Developed pipelines for 10x Visium HD data to profile chemokine hotspots and their immune cell recruitment in colorectal cancer (CRC) progression.
- Studied the tumor-stroma interface across varying grade of tumor to study the tumor microenvironment and discovered different immunoglobulins isotypes in low-grade (IgA) vs high-grade (IgG) dysplasia in CRC.
- Analyzed transcriptomic and cellular changes in acinar cells during PDAC Progression using Xenium & Visium HD datasets, with Dr. Zhen Zhao.
- Studied neutrophil extracellular traps (NETs) in liver metastasis using spatial/single-cell RNA-seq, mentored by Dr. Sep Gholami and Dr. José Adrover.
- Investigated fetal vs regenerative stem cell programmes in genetically distinct mouse models (APC, AK, AKP).

Bioinformatics Intern, Computational Biology Lab *Jun–Aug 2023*
New York Genome Center, Manhattan, NY

- Conducted quality control and downstream analysis of bulk/single-cell RNA-seq data from ALS patients collected by NYGC's Amyotrophic Lateral Sclerosis Consortium.
- Benchmarked different deconvolution methods for cell type in Bulk RNA-seq using a scRNA-seq reference.
- Studied the cellular patterns, especially that of oligodendrocytes, microglia, and astrocytes, in ALS.
- Built a Shiny app to visualize cell-type deconvolution results and differential gene expressions.

Research Assistant, Molecular Biology Lab *Aug 2022 – May 2023*
Ramapo College of New Jersey | Advisor: Dr. Ashley Stuart

- Transformed DH5α and BL21 bacterial cells with a plasmid vector containing DuraPETase, a plastic-degrading-enzyme.
- Extracted and purified DuraPETase by affinity chromatography from transformed cells.
- Performed sequence/structural analysis of the enzyme to find putative mutations sites for improved catalytic activity of the enzyme.

Preprints and Abstracts

- E. Gazzara, J. M. Adrover, A. Lui, S. Han, Z. Aminzada, **N. Bhandari**, N. Sivetz, V. S.Shirue, B. S. Shergill, M. B. Curtis, S. C. George, A. Cicala, A. Rishi, C. Chung, C. Devoe, H. Huang, M. Weiss, E Lou, D. A. Tuveson, S. Beyaz, P. M. K. Westcott, M. Egeblad, S.GholamibioRxiv 2025.05.30.657122; doi: https://doi.org/10.1101/2025.05.30.657122
- Yihan Qin, Daniel Zhang, Nikita Persaud, **Nischal Bhandari**, et al. Abstract LB475: Capture the early benign-to-malignant transition of colon cancer in the mouse. *Cancer Res* 15 April 2025; 85 (8_Supplement_2): LB475. https://doi.org/10.1158/1538-7445.AM2025-LB475
- Westcott PMK, Qin Y, Zhang D, **Bhandari N**, et al. Early changes to the colon tumor microenvironment during benign-to-malignant transition. *Cancer Research*, 84(22_Supplement): PR016, 2024. https://doi.org/10.1158/1538-7445.TUMBODY-PR016

Training and Workshops

Core Knowledge Series, Flow Cytometry, Mass Spectrometry, Genomics and Sequencing, Cold Spring Harbor Laboratory, 2025, *ongoing*

Academic Job Search Series: Navigating the Job Search & Interviewing, Cold Spring Harbor Laboratory, July 2025.

Biostatistics Summer Course, Cold Spring Harbor Laboratory, July 2024.

Biological Data Science Workshop, Drexel University (Virtual), Aug 2022
Learned Unix, cloud computing, Biopython, and AlphaFold-based structure prediction.

Selected Presentations

- **Tracking the Metaplastic, Reactive, and Inflammatory Nature of Acinar Cells during PDAC Progression**, CSHL Meetings: Single Cell Analyses, 2025.
- **Resolving the Spatial Dynamics of Early Cancer Progression**, Spatial Biology Meeting, Sequencing Core, CSHL, 2024 [Oral talk]
- **Differential Cell Composition and Gene Expression in ALS**, NY Genome Center, Summer Research Symposium, 2023 [Poster]
- **Understanding Protein Structure to Infer Functional Roles of a protein in a Cell, Diagnose Diseases, and Design Drugs**, National Collegiate Honors Council Conference, Dallas, 2022 [Poster]
- **Expression of DuraPETase from DH5-α and BL21 competent cells**, Honors Symposium, Ramapo College, 2022 [Poster]

Honors and Awards

- Distinguished Student Award – Bioinformatics, 2023
- Best Presentation Nomination – Honors Symposium, Ramapo, 2023
- Presidetial Scholar, Ramapo College, 2020-2024
- Opportunity Fund Award – Fulbright Commission Nepal, 2020
- Glocal Teen Hero – 20 Under 20 National Award, Nepal, 2020

Mentorship & Leadership

Institute of Rural Development *Aug 2025 – Present*
Research Mentor

- Mentored a high school fellow and introduced basic statistical research design, bioinformatics pipelines, and cancer pathways.

Association of Nepalese in Psychology and Neuroscience *Aug 2023 – May 2024*
Content Design Lead

- Led a team of two students to create content related to neuroscience of behavioral disorders for digital platforms and presentations in several schools of Nepal.

Ramapo College – Writing Center *Jan – May 2024*
Supplemental Instructor

- Co-led writing and critical thinking workshops for undergraduates.

Tutor – Statistics, Linear Algebra, and Discrete Mathematics, Math Dept, Ramapo College *Jan – Jun 2022*

- Conducted two-hours weekly tutoring sessions.

Founder & President, The Doer's Syndicate, Nepal *2018 – 2020*

- Lead youth campaigns and designed workshops with different NGOs and INGOs, tailored to environmental conservation, social responsibility, and global opportunities.

References

- Dr. Peter Westcott, Assistant Professor, Cold Spring Harbor Laboratory, westcott@cshl.edu
- Dr. Zhen Zhao, Adjunct Assistant Professor, Cold Spring Harbor Laboratory, zhaoz@cshl.edu
- Dr. Rui Fu, Senior Bioinformatics, Scientist, New York Genome Center, rfu@nygenome.org
- Dr. Ashley Stuart, Associate Professor of Biochemistry Ramapo College, astuart@ramapo.edu
- Dr. Paramjeet Bagga, Professor of Biology and Convener of Bioinformatics, Ramapo College, pbagga@ramapo.edu