

Nischal Bhandari

Computational Biologist, Cold Spring Harbor Laboratory
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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, Snake-make

Genomics/Bioinformatics: Seurat, DESeq2, edgeR, Scanpy, CIBERSORTx, ShinyApps

Research Experience

Computational Biologist, Westcott Lab

Jun 2024 – Present

Cold Spring Harbor Laboratory, NY

- Developed pipelines to profile chemokine hotspots and their immune cell recruitment in colorectal cancer (CRC) progression using visium HD spatial transcriptomics.
- Studied the tumor-stroma interface across varying grade of tumor to characterize the tumor microenvironment and discovered different immunoglobulins isotypes in low-grade (IgA) vs high-grade (IgG) dysplasia in CRC.
- Established pipelines to track the transcriptomic and cellular changes in acinar cells during pancreatic cancer progression using Xenium & Visium HD datasets, with Dr. Zhen Zhao.
- Studied neutrophil extracellular traps (NETs) in liver metastasis using spatial and single-cell RNA-seq with Dr. Sep Gholami and Dr. José Adrover.
- Investigated fetal vs. regenerative stem cell programmes in genetically distinct mouse models (Apc^{KO} , $Apc^{KO}Kras^{G12D}$, and $Apc^{KO}Kras^{G12D}Trp53^{KO}$).

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 annotation in Bulk RNA-seq using a scRNA-seq reference.
- Studied the cellular enrichment or depletion, especially that of oligodendrocytes, microglia, and astrocytes, in ALS compared to healthy samples.
- Built a Shiny app to visualize cell-type deconvolution results and differential gene expressions.

- Transformed DH5 α 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. Gholami bioRxiv 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>

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]

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.

Honors and Awards

- Distinguished Student Award – Bioinformatics Department, Ramapo College, 2023
- Best Presentation Nomination – Honors Symposium, Ramapo College, 2023
- Presidential Scholar, Ramapo College, 2020-2024
- Opportunity Fund Award – Fulbright Commission Nepal, 2020
- Global 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 Critical Reading and Writing workshops for undergraduates.

Tutor, Math Department, Ramapo College

Jan – Jun 2022

- Conducted two-hours weekly tutoring sessions for Statistics, Linear Algebra, and Discrete Mathematics.

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

Available upon request.