**Nischal Bhandari**

Bioinformatics Quantitative Biology Multiomics Cancer Immunology Neuroscience

830 Regent Dr, Westbury, NY 11590

201-887-6835 – [nbhandar@cshl.edu](mailto:nbhandar@cshl.edu)

Github: <https://github.com/nishcomp> & <https://github.com/1nishbh>

**Summary**

A scientist-in-training who is currently receiving training at **Cold Spring Harbor Laboratory** and spearheading spatial transcriptomics study of benign-to-malignant transition in colorectal cancer at Westcott Lab. Highly skilled in data analysis, pipeline development, and deployment of machine learning methods to study big biological datasets. Developed advanced skills in R, Python, Bash, Nextflow, Snakemake, and data sharing for reproducible results. Enhanced leadership skills alongside scientific skills through initiation of a journal club in college, teaching R to wet lab students at CSHL, cross-institutional collaboration, and presentations at interdisciplinary conferences.

**Education**

**Ramapo College of New Jersey** **Mahwah, NJ**

*B.S. in Bioinformatics and Data Science* Jun 2024

Presidential Scholar, Dean’s List

**Technical Skills**

**Programming Skills**: R, Python, SQL, SAS, SPSS Power BI, Tableau, Bash, ChimeraX, Modeller, Nextflow, Snakemake, Git, Docker, Singularity

**Genomics:** Bioinformatics packages (edgeR, Seurat, CIBERSORTx, DESEq2, scanpy, shinyapps etc.), dimensionality reduction, cell segmentation, and pipeline development

**Lab Skills**: PCR, Chromatography, Distillation, Reagents preparation, Gel electrophoresis, SDS page electrophoresis, Cell culture, Bacterial transformation, Spectrophotometry, Nanodrop, Lab report writing

**Data Analysis**: Study design, data collection, hypothesis testing, multivariate analysis

**Research Experience**

**Cold Spring Harbor Laboratory** **Cold Spring Harbor, NY**

*Westcott Lab* 06/2024 - Present

*Computational Biologist*

Current Research Projects

* Develop the pipelines to study the next generation data from 10X Visium HD sequencing to study the chemokines, profile immune cells in their immediate tumor microenvironment, and obtain the pro-or-anti-inflammatory gene signatures in the chemokine zone and their neighborhood compared to the chemokine-secluded regions
* Profiled the enriched pathways, genes, and fetal versus regenerative stem cell colonies in heterogeneous human colon cancer samples with low-grade dysplasia, high-grade dysplasia, intramucosal carcinoma, and varying genotypes in mouse samples (APC, AK, AKP genotypes)
* Analysis of Xenium and Visium HD samples to find copy number variation and cell trajectories in the tissues going under Acinar-Ductal metaplasia in pancreatic cancer (with Dr. Zhen Zhao)
* Study the neutrophil extracellular traps (NETs) in liver metastases in terms of single-cell and spatial transcriptomics to find the genetic/cellular environment of NETs and to develop the potential therapeutic targets (co-mentored by Dr. Sep Gholami and Dr. José M Adrover, JHU)

**New York Genome Center** **Manhattan, NY**

*Computational Biology Lab* June-August 2023

*Bioinformatics Intern*

* Carried out the initial quality control checks and assembled FASTQ and metadata files for downstream analysis
* Analyzed bulk and single-cell RNA-seq data to study the differential gene expression in ALS versus control samples from spinal cord and brain.
* Deconvoluted bulk RNA-seq data to study the cell type distribution in ALS samples.
* Built shiny web app to help researchers visualize their cell types proportions in their bulk samples

**Ramapo College of New Jersey** **Mahwah, NJ**

*Cell and Molecular Lab, Dr. Stuart* August 2022 – May 2023

*Research Assistant*

* Analysis of DuraPetase, a thermostable PETase plastic-degrading enzyme using DH5α and BL21 cells with PET30 and pRSET vectors.
* Gene Sequence Analysis of DuraPetase variants.
* DuraPetase structure and Potential mutations analysis.

**Independent Research** **Mahwah, NJ**

*Research design and computational analyses* Aug-Dec 2022

* Collaborated with a lab partner to study the mechanisms of Alzheimer's disease with mock experiment designs to measure the cognitive decline in mice and potential drug development.
* Analyzing public transcriptomic and proteomic databases to understand the HSV-1 virus which is known to be found in the brain of Alzheimer's patients and is known to have a relationship with neuropathology.
* Computational Analysis of the protein coded by the viral DNA, protein-protein interactions, and its similarity to APOE4 genes which is also known to be involved in Alzheimer's Disease.

**Professional Training & Experience**

**Association of Nepalese in Psychology and Neuroscience** **Digital and Nepal**

*Content Design - Lead* August 2023 - Present

* Manage and guide a team of five undergraduates and high school students to design content in Neuroscience for social media outlets.
* Oversee the research summaries, presentations, and modules in behavioral disorders and learning disabilities.

**Critical Reading and Writing Center, Ramapo College Mahwah, NJ**

*Supplemental Instructor* Jan-May 2024

* Conducted supplemental classes to guide students through writing assignments, ideation phases, and classroom discussions
* Delivered lectures alongside professor Peri to encourage classroom discussion and critical thinking

**Biological Data Science Summer Workshop** **Virtual**

*Drexel University* August 2022

*Trainee*

* Participated in the workshop hosted by Drexel University to learn the basics of Unix, Biopython, cloud computing, machine Learning, and deep Learning for proteins.
* At the end of the program, I learned to retrieve information from NCBI, analyze the different genomic datasets, and integrate AlphaFold for structural prediction.

**Ramapo College** **Mahwah, NJ**

*Department of Psychology* January-June 2022

*Tutor (Statistics)*

* Tutored students five hours a week on statistical analysis, statistical research design, and the mathematical basis of research (correlation, p-values, confidence intervals, hypotheses testing, interaction effects, etc.)

**The Doer’s Syndicate,** **Kathmandu Nepal**

*Founder President*  2018-2020

* Mentored and led the first national Eco-Youth Summit to study eco-friendly technological innovations across Nepal.
* Planned and executed several youth leadership summits and awareness programs like Mental health awareness month, Domestic violence prevention, Communicable diseases and prevention, etc.

**Junior Academy*,* New York Academy of Sciences** **Virtual**

*Project Lead August 2017 - January 2018*

* Prototyped two methods for sustainable urbanization: a robot to collect wastes from water bodies and make toys out of garbage and recycled bricks for buildings.

**Publications**

1. Peter M.K. Westcott, Yihan Qin, Daniel Zhang, Nikita Persaud, Zakeria Aminzada, Nischal Bhandari, Colin McLaughlin, William Rideout, Santiago Naranjo, Song Han, Rodrigo Romero, Claire Regan, Jonathan Preall, Semir Beyaz, Tyler Jacks, Zhen Zhao, Sepideh Gholami; Abstract PR016: Early changes to the colon tumor microenvironment during benign-to- malignant transition. *Cancer Res* 15 November 2024; 84 (22\_Supplement): PR016. <https://doi.org/10.1158/1538-7445.TUMBODY-PR016>

**Posters and Presentations**

1. [Analysis of Differential Cell Type Composition and Gene Expression in ALS with Spinal Cord and Cortex Bulk RNA-seq](https://drive.google.com/file/d/1APRfMiGevdTTsU8yeHXfq2jITza5XvA1/view?usp=sharing), **New York Genome Center**, June-August 2023
2. [An Overview of Alzheimer’s and Prion Diseases with Potential Drug Docking sites](https://docs.google.com/presentation/d/1ID1CiH-K9QQ5PDKC3qOyHYwQKIPnhLcN/edit?usp=sharing&ouid=107793525973914796422&rtpof=true&sd=true), **National Collegiate Honors Council**, Dallas, Texas, Sep 2022
3. [**Expression and Purification of DuraPETase from DH5-α and BL21 competent cells**](https://drive.google.com/file/d/1cgINaXkO4Ll1iwvMmv1xqhXU7DQl8_aD/view?usp=sharing), **Honors Symposium**, Ramapo College, Aug 2022

**Honors and Awards**

Distinguished Student Award & Scholarship in Bioinformatics, **Bioinformatics Department**, 2023

Best Presentation Nomination, **Ramapo Honors Symposium**, Ramapo, 2023  
Opportunity Fund Award, **Fulbright Commission - Nepal**, 2020  
20 Under 20 – National Heroes of Nepal, **Glocal Teen Hero**, Nepal, 2020

**References**

1. **Dr. Peter Westcott** | Assistant Professor at Cold Spring Harbor Laboratory | [westcott@cshl.edu](mailto:westcott@cshl.edu)
2. **Dr. Paramjeet Bagga** | Convernor of Bioinformatics, Ramapo College of New Jersey | [pbagga@ramapo.edu](mailto:pbagga@ramapo.edu)
3. **Dr. Rui Fu** |Senior Bioinformatics Scientist at New York Genome Center | [rfu@nygenome.org](mailto:rfu@nygenome.org)
4. **Dr. Ashley Stuart** | Associate Professor of Biochemistry | [astuart@ramapo.edu](mailto:astuart@ramapo.edu)