Vaishnavi Bhamre

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Professional Summary

Graduate student in Bioinformatics with strong expertise in **NGS** data analysis, pipeline development, and computational biology. Proficient in Python and R scripting with hands-on experience building interactive applications using **Shiny** and **Streamlit**. Skilled in **UNIX/Linux** computing environments, Docker containerization, version control (Git), and relational databases (SQL/MySQL). Experienced in common bioinformatics workflows including read mapping, gene expression quantification, variant calling, and Illumina sequencing data analysis. Background in oligonucleotide therapeutics with **wet lab** experience in **nanoparticle-based drug delivery** systems. Adept at developing reproducible pipelines and communicating complex genomic findings to scientific audiences in both oral and written forms.

Education

Northeastern University, Boston, MA **August 2024 – May 2027**
Master of Science in Bioinformatics

Rajeev Gandhi Proudyogiki Vishwavidyalaya, Bhopal, India **August 2019 – July 2023**
Bachelor of Pharmacy with Honors

Makhanlal Chaturvedi National University, Bhopal, India **May 2021 – January 2022**
Diploma in Computer Applications

Core Competencies

• **Programming & Tools:** Python, R, SQL, MySQL, Git (version control), Docker, Nextflow, UNIX/Linux, HPC, Cloud computing (AWS), Shiny, Streamlit
• **NGS & Bioinformatics:** Illumina sequencing analysis, read mapping (Bowtie, HISAT2, STAR), variant calling (GATK, Samtools), gene expression quantification (htseq-count, DESeq, Salmon, Subread), BLAST, QIIME2, oligonucleotide sequence analysis, genome/transcriptome homology mapping
• **Data Science:** Machine learning, statistical modeling, biostatistics, data visualization, high-throughput screening, gene expression profiling
• **Pharmaceutical Sciences:** QC & QA, UV-Vis and IR spectroscopy, oligonucleotide therapeutics, nanoparticle drug delivery, formulation development and drug stability testing
• **Laboratory Skills:** Animal handling (mice models), cell culture, microscopy, ELISA, in vivo sample collection, lipid nanoparticle preparation

Professional Experience

Kalpraj Techno Fab Pvt. Ltd. (KTF Pharmaceuticals), India **December 2023 – July 2024**
Quality Control Analyst
• Conducted analytical testing (UV-Vis, IR Spectroscopy) for drug purity and stability; ensured adherence to cGMP standards.
• Developed and implemented data-driven documentation workflows, reducing turnaround time by **15%** and improving operational efficiency.
• Updated and optimized SOPs, enhancing documentation accuracy by **30%** through systematic process improvements.
• Collaborated cross-functionally with production and QA teams to troubleshoot analytical deviations and streamline quality processes.

Sun Pharmaceuticals, India **June 2023 – August 2023**
Trainee Sales Executive
• Managed a portfolio of **20+** accounts, achieving a **15%** increase in revenue through data-driven client engagement and analytical reporting strategies.

Comworld Remedies, India **June 2022 – July 2022**
Intern Trainee
• Assisted in formulation development, identifying process inefficiencies and implementing workflow improvements.
• Enhanced inventory management accuracy by **15%** through data-driven tracking, reporting, and database management.

Bioinformatics & Research Projects

• **[Wet Lab] Oligonucleotide-Loaded Solid Lipid Nanoparticle Development:** Designed and synthesized solid lipid nanoparticles (SLNs) for oligonucleotide therapeutic delivery targeting Nateglinide. Performed nanoparticle characterization including particle sizing, zeta potential analysis, and encapsulation efficiency studies. Optimized formulation parameters for enhanced oligonucleotide stability and controlled release profiles. Conducted in vitro release studies and stability testing under various storage conditions. Presented the article '***Introduction to Nateglinide from Solid Lipid Nanoparticles***' at **SAC-ACCP** International Conference (100+ attendees), demonstrating ability to communicate complex therapeutic development to scientific audiences.

• **NGS Microbiome Pipeline:** Developed an automated pipeline for **16S rRNA** microbiome analysis using **QIIME2**, Python, and Docker containers. Identified significant microbial shifts related to high-fiber diet impact on gut health in Type 2 diabetes mellitus patients. Implemented reproducible workflows with version control (**Git**) and best practices for scalability.

• **Interactive Bioinformatics Application:** Built Shiny and Streamlit application prototypes for visualizing gene expression data, integrating analysis results with summary databases, and supporting bioinformatics pipeline outputs.

• **Machine Learning Pipeline:** Created an automated **ML** pipeline for 'Mental Health State' Prediction implementing Naive Bayes, Random Forest, Logistic Regression, and stacked ensemble models. Applied PCA and SMOTE techniques for feature engineering and class balancing. Project Repository: GitHub - ML Mental Health Prediction

• **In Vivo Research:** Performed animal handling and sample collection using **mice models**, including subcutaneous, intravenous, and intraperitoneal injections with accurate dosing protocols and animal welfare compliance.

• **Scientific Publication:** Authored comprehensive review article on "***Current and Emerging Therapies for Type II Diabetes Mellitus***," highlighting innovative treatments including oligonucleotide-based therapeutics and future research directions.

Certifications

• Hands-On Workshop on **Molecular Docking**, DevResearch & IScMicrobiology (Jun 2025)