Rhea Charles BDS MSPH

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Overview of skills and experience:

- Research experience (2.5 years) with various "omics" data types (DNA-seq, RNA-seq, metabolomics, proteomics).
- Participating in coursework enhanced proficiency in analyzing and visualizing genomic data through the utilization of R, PyMOL, and various tools including FastQC, HISAT, Cufflinks, Cuffdiff, DEseq, SLURM, as well as handling SAM and BAM files for RNA-Seq and Next Generation Sequencing (NGS) data analysis.
- Performed statistical learning methods: Machine Learning techniques (linear and non-linear regression analysis, K-Nearest Neighbors) and Mendelian Randomization analysis using R for coursework and thesis research.
- Explored genetic contribution to human health and disease using R, Python/Perl and Unix/Linux subsystems.
- Skilled in omics experimental design, data quality control, differential expression analysis, biological interpretation, and delivery of results.
- Developed and worked with bioinformatics pipelines for multi-omics data analysis and visualization.

RELEVANT COURSEWORK

Projects:

1. Replicated results from research papers using a computational pipeline involving quality control, alignment, quantification, normalization, and DESeq2-based differential expression analysis, followed by R visualization with boxplots.
2. Based on multiple literature reviews I presented a research proposal idea titled 'Comparative Analysis of Gene Expression Profiles in PD-1-Treated Cytotoxic T Lymphocytes from Melanoma Patients: Implications for Immunotherapy' which would use RNA Sequencing, Variant Calling, and Differential Gene Expression Analysis.

PROFESSIONAL RESEARCH EXPERIENCE

Graduate Student, University of South Florida, Tampa, FL Aug 2022 – Present

Mentor – Dr. Xiaoming Liu

- Research for Thesis titled 'Unraveling the Impact of Multiple Exposures on Periodontitis Using Mendelian Randomization' using RStudio to identify potential implicative genetic variants.
- Conducted literature review for instrumental variable selection. Managed and analyzed large GWAS datasets containing single nucleotide polymorphisms (SNPs), and allele frequencies, for instrumental variable selection.
- Collected and analyzed data from data repositories: Finngen, open GWAS, University of Bristol, Pan-UK Biobank, and the Social Science Genetic Association Consortium (SSGAC).
- Utilized GNU/Linux and bioinformatics tools like liftover and GRCh38 and GRCh37 Human genome reference builds to build a pipeline to map rsids (SNPs) to coordinates.
- Performed statistical tests like MR regression analysis, and leave-one-out analysis, to determine causal inference for Mendelian randomization results.
- Used forest, scatter, and funnel plots for data visualization in RStudio.

Student Research Assistant, University of South Florida Genomics Lab- Dr. Bi Zhao May 2023 - Dec 2023

- Extracted, organized, and analyzed proteomic data contributed to the development and validation of machine-learning models using Python. The idea of these models was aimed at improving predictions based on disordered proteins, linkers, and protein kinase functions.
- Provided research support by analyzing phenotypic and genotypic data using Python and RStudio. Used packages like NumPy, pandas, ggplot2, dplyr, tidyr, caret, etc.
- Used bioinformatics tools like BLAST, and CD-HIT for sequence similarity searches and variant calling for analysis of next-generation sequencing (NGS) data.
- Compiled and parsed data from Uniprot and Disprot in formats like FASTA, FASTQ, JSON, TSV, CSV, and VCF using bash scripts for multi-omics data analysis.

WORK EXPERIENCE

Graduate Teaching Assistant, University of South Florida, Tampa, FL

Course: Modern Epidemiology using R (PHC 6934)/Modern Epidemiology (HSC 4933) - Dr. Edwin Michael Aug 23 – Dec 24

- In-person R practical sessions for undergraduate and graduate students, offering troubleshooting assistance and guidance for using RStudio to conduct epidemiology-related data analysis.
- Held in-person as well as virtual office hours once a week which aimed at enhancing the overall learning experience.
- Effectively shaped course modules. Evaluated student work and provided constructive feedback.

Graduate Teaching Assistant, University of South Florida, Tampa, FL
Course: Introduction to Health Professions (HSC 2000) - Dr. Cooperman and Dr. Shabnam Mehra Aug 2023 – Present

- Evaluated student work, delivering constructive feedback and assessment. Delivered presentations on course topics like avoiding plagiarism to help promote understanding of course requirements. Additionally, technical support, troubleshooting, and one-on-one assistance were also provided.

Quality Systems Officer, New Mowasat Hospital, Kuwait Sep 2021 - July 2022

- Helped track and monitor data to identify patterns for risk assessment related to patient readmissions to find the root cause as well as to maintain a log of these issues.
- Process improvement strategies within the hospital by successfully tackling challenges by on-site monitoring of these processes to find root causes to maintain the quality of hospital standards.

Intern Dentist, SDM Dental Hospital, Karnataka, India Sep 2019 - Oct 2020

- Hands-on clinical experience, focusing on patient needs and therapeutic interventions.
- Performed research on bruxism and the challenges of diagnosis.
- Performed public health interventions for children and adults from poor socioeconomic backgrounds with a lack of access to oral healthcare which required interdisciplinary communication.

EDUCATION

Master of Science in Public Health University of South Florida, Tampa, FL August 2022 - Expected December 2024
Concentration: Genomics **GPA:** 3.8/4.0

Bachelor of Dental Surgery 2015 - 2020
Rajiv Gandhi University of Health Sciences, India **GPA:** 3.5/4.0

MEMBERSHIPS

- **Member**: Delta Omega Public Health Honorary Society March 2024 - Present