MD ZAINUL ALI

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Websites, Portfolios, Profiles

- www.linkedin.com/in/mdzainulali
- https://github.com/iam-zain
- https://imza.in

Summary

Ph.D. researcher specializing in early detection of Parkinson's Disease through integration of non-motor symptoms, **omics data**, and **machine learning**. Experienced in **data analysis (Python, R, SQL)**, multi-omics studies, and predictive modeling. Skilled in building **diagnostic tools with Flask and Shiny**, and in optimizing workflows using **Bash/Linux**. Strong foundation in **biotechnology and biochemistry**, with a commitment to advancing biomedical research through data-driven and collaborative approaches.

Research Experience

Ph.D. Nov 2020 to Current

University of Hyderabad - Hyderabad, India

- **Thesis Title:** Analysis of non-motor symptoms and the role of DNA methylation in the early diagnosis of Parkinson's Disease.
- **Brief description of the work:** At early stages, several non-motor symptoms occur, making it crucial to identify them to halt the progression of the disease. Machine learning models can aid in distinguishing between diseased individuals and healthy controls. The primary programming tools utilized for this purpose are R and Python.
- **Supervisor:** Dr. Pankaj Singh Dholaniya.

M.Sc Jul 2019 to Oct 2020

University of Hyderabad - Hyderabad, India

- **Project Title:** Analysis of Complex-1 associated genes in Parkinson's disease for risk assessment.
- **Supervisor:** Dr. Pankaj Singh Dholaniya.
- **Web Application-** https://iam-zain.github.io/parkinson-predictor/

Projects

Identification of Early Biomarkers for Parkinson's Disease Using Machine Learning and WGCNA

- Applied **ML** and **WGCNA** on clinical and transcriptomic data to detect early biomarkers, improving patient-healthy control classification.

Early Diagnosis Tool Using Transfer Learning & Collaborative Filtering

- Built predictive models using **Python** and deployed prototypes with **Flask**, enabling interactive disease detection testing.

Analysis of Complex-I Associated Genes in Parkinson's Disease

- Developed an **online predictor tool** using HTML, CSS, JavaScript to assess gene-based risk in Parkinson's Disease.

Linking Brain MRI and Gene Expression via Contrastive Learning

- Integrated MRI imaging with transcriptomics using **contrastive learning** for systems-level Parkinson's analysis.

Predicting Age from Epigenetic Data

- Designed ML models using **Top2B-associated CpGs** for biological age prediction.

Logic-Based Pathway Analysis of Parkinson's Disease

- Developed a Boolean network model integrating PD-associated genes with mitochondrial metabolic factors to study the disease dysfunction.

Skills

- **Programming:** Python, R, SQL, and Bash
- **Machine Learning & AI**: ML, Deep Learning, Transfer Learning, Contrastive Learning, Collaborative Filtering
- **Bioinformatics**: Bulk RNA-seq, Single-cell RNA-seq, WGCNA, Epigenomics
- **Tools/Frameworks**: Flask, Shiny, Git, Docker

Education

Ph.D., **Biotechnology and Bioinformatics** 2026
University of Hyderabad - Hyderabad, India
GPA: 9.71

Master of Science, **Biotechnology** 2020
University of Hyderabad - Hyderabad, India
GPA: 8.42

Bachelor of Science, **Biochemistry** 2018
Aligarh Muslim University - Aligarh, India
GPA: 7.69

Conferences & Workshops

- **Oral Presentation:** Titled- Integrating Non-Motor Symptoms and Gender Variability in Machine Learning for Early Parkinson's Disease Detection, Conference by MDS International Congress, Philadelphia, US, 27th September to 1st October 2024.
- **Poster Presentation:** Titled- Gender Specific Classification Models for Parkinson's Disease using Non-Motor Symptoms and DNA Methylation Data, Conference by MDS International Congress, Copenhagen, Denmark, 27th to 31st August 2023.
- **Workshop** by MDS-AOS Neuropathology and Neuroimaging Integrated Education Course for Movement Disorders in Seoul, Korea, 16th & 17th February 2024.
- **Workshop** by MDS-AOS Basic Science School: Translational Neurogenetics with Focus on Movement Disorders in Manila, Philippines, 13th & 14th April 2023

Certifications & Training

- One Month International Workshop on **Proteins: Sequence Structure & Function** - 2025
- One Month International Workshop on **Genomes: Sequence to Insights** – 2025
- One Month International Workshop on **Bioinformatics Data Science and Machine Learning with Python** – 2024
- One Month International Workshop on **NGS: Sequence to Insights** - 2024
- Four-Day Virtual Workshop on **Decode Proteomics with R Programming** - 2024
- Two-day Virtual Hands-on Workshop titled **Data into insights: Bridging Metabolomics and Systems Biology** - 2024
- 15-day Virtual Internship entitled on Introduction to **Next Generation Sequencing and Whole Genome Sequencing for Beginners**

Publications

- **Oxidative phosphorylation mediated pathogenesis of Parkinson's disease and its implication via Akt signaling.**, Md Zainul Ali, Pankaj Singh Dholaniya, Review article, 2022, Neurochemistry International, I.F. 4
- **Early Diagnosis of Parkinson's Disease: Utility of Animal Models.**, Neha S, Mohammad Ahmad, Baby Kumari, Md Zainul Ali, Pankaj Singh Dholaniya, Book chapter, 2022, Intech open, True

Accomplishments and awards

- CSIR-JRF - 2020
- CSIR - SRF - 2022
- GATE - 2020

Hobbies and interests

- Creative writing (poetry)
- Reading novels & literature
- Cricket

Personal Information

Date of birth: 12-01-1996
Nationality: India
Gender: Male

Languages

English: C1
Advanced

Hindi: B2
Upper Intermediate

Urdu: B1
Intermediate

Bengali: B1
Intermediate

Arabic: A2
Elementary

References

- **Dr. Pankaj Singh Dholaniya:** Assistant Professor, Department of Biotechnology & Bioinformatics, University of Hyderabad, India | Tel: +91 40-2313 4591 | Email; pankaz@uohyd.ac.in
- **Prof. Niyaz Ahmed:** Professor, Department of Biotechnology & Bioinformatics, University of Hyderabad, India | Tel: +91 4023134585 | Email: ahmed.nizi@gmail.com, niyaz.ahmed@uohyd.ac.in