DANISH ASLAM

Education

M.Sc. in Bioinformatics Jamia Millia Islamia (JMI), India | October **2021** – June **2023**

- CGPA: **9.61**/10.00
- Thesis: "Development of an Intron-Exon Boundary Junction Prediction software using Physicochemical DNA features"
- Advisors**:** Prof. B. Jayaram (External) & Prof. Rafat Parveen (Internal) | Grade: A+ (Highest in the batch, 2023)

Relevant Coursework: Introduction to Bioinformatics, Comparative and Functional Genomics, Chemoinformatic and Chemogenomics, Systems Biology, Biochemistry, Essential Mathematics & Biostatistics, Database Management System, NGS Data Analysis, Structural Bioinformatics and Drug Design, Machine Learning Techniques in Bioinformatics

B.Sc. in Life Science University of Delhi (DU), India | July **2018** – May **2021**

- CGPA: **8.848**/10.00
- Senior Mentor (Alumni Network)

Relevant Coursework: Medical Diagnostics, Physiology and Biochemistry, Genetics and Evolutionary Biology, Bioinformatics, Animal Biotechnology, Immunology, Analytical Techniques in Plant Sciences, English

Technical Skills

Programming: Python/Biopython, R, C/C++, Bash Scripting
Artificial Intelligence: Deep Learning/Machine Learning techniques, Large-scale data collection and integration
Bioinformatics: NGS analysis, Structural Bioinformatics, Systems Biology tools
Research & Development: Git, Linux, MySQL, Benchmarking, Technical writing, Copy-editing/Reviewing

Professional Research Experience

Project Scientist Indian Institute of Technology (IIT) Delhi, India | January **2023** – **Present**
Supervisor: **Prof. B. Jayaram (**Supercomputing Facility for Bioinformatics and Computational Biology)

(a) Genome Workbench Development **[Underway]**
- **Conceptualized** and **developing** an open platform to make our biophysical features-based genic/regulatory elements prediction framework accessible to all.

(b) Biophysical profiling of eukaryotic genome sites using physicochemical features of DNA **[Completed]**
- **Characterized** eight genomic sites (Coding sequences, Promoters, Gene boundaries, Exon-Intron boundaries, Codons), ~4.6 million in number and established a novel prediction framework for eukaryotic genome annotation.

(c) Mentored (June 2024 – July 2024) a final year Master's (Bioinformatics) student for a **two-month summer internship,** training her in large-scale genomic data extraction and analysis.

(d) Resource Person (February 2024) **in "7-Days Hands-on Bioinformatics Workshop for Genomic and Proteomic Analysis,"** organized by School of Allied Sciences, DEV BHOOMI UTTARAKHAND UNIVERSITY, INDIA.
- **Demonstrated** Phylogenetic Analysis and gave a hands-on session on the in-house tools, Chemgenome, Seq2Str, and TmPredictor.

Previous Roles and Contributions: **Jr. Project Assistant (Tech)**; **Scientific Administrative Assistant; Research Intern**

(e) Development of an Intron-Exon Boundary Junction Prediction tool using physicochemical DNA features (Backbone, Base Pair (BP)-Axis, Intra BP, Inter BP, Hydrogen bonding, Stacking, Solvation) **[Completed]**
- **Developed** and **hosted** ChemEXIN, an accessible user-interactive command line utility at GitHub.
- **Formulated** the final manuscript along with a manual with examples for easy interpretation and knowledge transfer.
- **Benchmarked** and **led** the comparison with five widely used DNA-sequence based genome prediction tools.
- **Conducted** the training, testing, and evaluation phases to develop an exhaustive prediction pipeline.

(e) Investigation of a codon-usage-bias-based physicochemical characterization of gene/non-gene sequences

- **Mentored** (September 2023 – May 2024) a final year M.Tech. (Molecular engineering, Chemical Synthesis and Analysis) Research Intern.
- **Supported** and **trained** in daily laboratory tasks (bash scripting, data handling, and data analysis).
- **Assisted** with the project reports and presentations in mid-semester and final evaluations.

Bioinformatics Associate Indian Agricultural Research Institute | September **2024** – Present
Collaborator: **Dr. Renu Pandey** (Mineral Nutrition Laboratory, Division of Plant Physiology)

- **Leading** the identification of the **P1BS** motif in the **promoter** region of the whole genome sequence in rice.
- **Validated** the genes of interest by expression analysis under various **abiotic stresses** (Drought, Salinity, etc.).
- **Mentored** a second year Ph.D. student in large scale data analysis and collection.

Research Training and Internships

Research Trainee Department of Computer Science, JMI | July **2022** – July **2023**
Supervisors: **Dr. Khalid Raza** (Computational Intelligence and Bioinformatics Lab) & **Prof. Rafat Parveen**

(a) A Gene-to-Drug insight into a multi-targeted inhibitor search against Alzheimer's disease **[Completed]**

- **Designed** and **conceptualized** a multi-targeted study with APP, BACE1, APOE, GSK3B, MAPT, PSEN1 genes in the center of it, supported by a thorough literature review to support their inclusion.
- **Supported** a comprehensive systematic review of Lung Cancer, providing valuable insights and assistance.
- **Contributed** to two book chapters, exploring the applications of artificial intelligence (AI) in various disease domains, including disease progression, treatment, and drug discovery.

(b) Investigation of the BACE1 gene and its regulatory neighbors to investigate their contribution to the progression of Alzheimer's disease **[Completed]**

- **Implemented** custom Python/R pipelines to extract and preprocess essential datasets sourced from GEO and SRA.
- **Utilized** the extracted datasets to perform meticulous analyses, gaining deep insights into the role of the genes-of-interest in Alzheimer's disease.
- **Employed** statistical and computational methods to analyze the data, drawing significant conclusions.

Bioinformatics Intern Department of Botany, Sri Aurobindo College (Day), DU | October **2020** – January **2021**
Mentor: **Prof. Rashmi Mathur**

- **Led** a "**Drug Discovery and Development"** review project.
- **Presented** the results as a semester-end presentation, earning the highest grade in the class.

Publications

a) Published

- Sharma, D., **Aslam, D.,** Sharma, K., Mittal, A., & Jayaram, B. (2025). Exon-Intron Boundary Detection Made Easy by Physicochemical Properties of DNA. Molecular Omics. The Royal Society of Chemistry. https://doi.org/10.1039/D4MO00241E
- Ahmad, S., **Aslam, D.,** Ansari, A., Bhat, A. M., & Raza, K. (2024). Deep learning in computer-aided drug design: a case study. In: Raza, K., Barh, D., Singh, D., Ahmad, N., (eds) Deep Learning Applications in Translational Bioinformatics. Elsevier. https://doi.org/10.1016/B978-0-443-22299-3.00012-8
- Siddiqui, F., **Aslam, D.,** Tanveer, K., Soudy, M. (2024). The Role of Artificial Intelligence and Machine Learning in Autoimmune Disorders. In: Raza, K., Singh, S. (eds) Artificial Intelligence and Autoimmune Diseases. Studies in Computational Intelligence, vol 1133. Springer, Singapore. https://doi.org/10.1007/978-981-99-9029-0_3

b) Submitted (In Review)

- Sharma, D., **Aslam, D.**, Mittal, A., & Jayaram, B. **(2025)**. Structure and Dynamics dictate the Functional Destiny of Genomic DNA across Multiple Organisms.

Summary: DNA is a dynamic molecule with various regulatory elements that are crucial for regulating gene expression, maintaining genome stability, and facilitating various cellular processes. We analyzed eight key genomic elements (~4.6 million in total) to uncover their critical physicochemical profiles, and established a novel framework that leverages structural and energetic features to precisely annotate these sites with unprecedented accuracy across 11 eukaryotes of varying complexities.

c) Under Preparation

- **Aslam, D.**, Ahmad, S., & Raza, K. **(2024)**. Gene to Drug: In-silico study for a multi-targeted inhibitor against Alzheimer's disease.

  Summary: Centered around a cluster of genes identified through a semi-automated literature mining approach at the NCBI, we worked on a multi-targeted gene-to-drug strategy, rooted in their involvement in the progression of Alzheimer's disease. We conducted validation through molecular dynamics simulation and molecular fingerprinting.

Awards and Recognition

Academic Excellence:
- CGPA 9.61/10.00, M.Sc. Bioinformatics, Jamia Millia Islamia, 2023
- CGPA 8.848/10.00, B.Sc. Life Science, Sri Aurobindo College (Day), University of Delhi, 2021
- **Gold Medalist** (school-level) in Biology (95/100), with distinction in all subjects, Year 12, Bal Vidya Mandir Sr. Sec. School, Sambhal, UP, India
- **Gold Medalist** (national-level), Grade A1 with perfect CGPA (10.00/10.00) in all subjects, CBSE Secondary School Examination, Year 10

Research and Presentations:
- **First Prize,** Three-Minute Thesis Competition, 2023
- **Third Prize,** Poster Presentation "Marine Debris: A Man-made Curse", National Seminar sponsored by ICSSR on "Technology for Environmental Sustainability, Socio-economic Responsibilities and Associated Entrepreneurial Opportunities of the 21st Century," March 2019
- **First Prize,** Poster Presentation "Ocean Waste," OSLAVA: Department of Botany Annual Fest, February 2019

Competitive Achievements:
- **Gold Medalist** (city-level), 6th Science Olympiad Foundation (SOF), International English Olympiad (IEO), 2016
- **Gold Medalist** (city-level), 5th Science Olympiad Foundation (SOF), International English Olympiad (IEO), 2015
- **Gold Medalist**, Problem Solving Assessment (PSA), Bal Vidya Mandir Sr. Sec. School, Sambhal, UP, India, 2014
- **Bronze Medalist** (school-level), 299th International Rank, 15th Science Olympiad Foundation (SOF), National Science Olympiad (NSO), 2013

Scholarships and Recognition:
- **Founding Member,** Abhyaarany: A Queer Safe Space & Mental Health Resource Cell, SAC (Day), DU, 2021
- **Awarded** under the Free Laptop Distribution Scheme, **Government of Uttar Pradesh Merit Initiative** for State-level highest-scoring students in Secondary and Higher Secondary School Examinations, 2014-2016

Academic and Community Service

Member, Global Association of Economics Education, 2021 – 2023
Formulated and **edited** content for the GAEE, Jamia Millia Islamia Chapter's social media accounts.

Volunteer, Recover Media, 2021
Worked as an editorial & networking volunteer in a student-led initiative to discuss the contemporary gaze on gender, politics, sexuality, health, art, and culture.

Student Representative, Internal Complaints Committee, 2020 – 2021
Worked alongside college administration during my undergraduate studies regarding issues related to harassment/violence within the campus.

Member, SAGE (The Debating Society), 2018 – 2021
- **Appointed** as the Editorial & Graphics Head.
- **Formulated** write-ups, and graphics for the social media accounts.
- **Performed** and **wrote** original thematic pieces and won inter-college slam poetry and debate competitions.

Member, SAMVEDNA (The Gender Sensitization Forum), 2019 – 2021
- **Appointed** as Research & Editorial Head, leading content curation and editorial activities.
- **Served** as Chief Editor of "Lagniappe," a student-led newsletter, publishing three issues that explored topics through diverse mediums such as poetry and write-ups while ensuring that the newsletter addressed timely and relevant themes, fostering meaningful discussions on gender sensitization and critical social issues.
- **Organized** and **moderated** book discussions to promote awareness and dialogue around gender and sexuality.

Member of School's Cabinet

Academic Captain (Year 12)

- **Participated** in academic discussions and contributed to editing write-ups for the school's annual magazine (prospectus).
- Actively **engaged** in the School's English Club, participating in discussions and activities.
- **Organized** extra classes after school hours for students with limited resources based on their feedback.
- **Volunteered** in the organizing committee for several intra- and inter-school competitions.

Prayas (Blue) House Captain (Year 11)

- **Led** and **managed** all house activities and participation, resulting in the house being awarded "House of the Year."
- **Achieved** a record-breaking number of victories in an academic year, with 23 victories contributed personally.

Prefect Prayas (Blue) House (Year 9 & 10)

- **Represented** the school in various national-level debates, quizzes, and group discussions.

Student Mentor, 2012 – 2016

- **Assisted** peers in preparing for the Problem Solving Assessment (PSA) exam.
- **Mentored** students struggling with academics, helping them improve class performance through daily classwork and developmental guidance.
- **Volunteered** to support peers in English speaking, listening, and writing exams as part of the curriculum.
- Regularly **addressed** the school during morning assemblies, providing updates on news and guidelines.
- **Maintained** and **monitored** student progress by preparing detailed improvement reports as the Class Representative for three consecutive years.