

# DANISH ASLAM

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\*Supercomputing Facility for Bioinformatics & Computational Biology

## Education

Jamia Millia Islamia (JMI)	New Delhi, India
<b>MS in Bioinformatics</b>	Oct. 2021 – June 2023
	GPA: 9.61/10.00
<b>Thesis title:</b> “ <i>Development of an Intron-Exon Boundary Junction Prediction software using Physico-chemical DNA features</i> ”	
Thesis advisor: <b>Prof. B. Jayaram</b> , co-advisor: <b>Prof. Rafat Parveen</b> ; <b>Grade: A+</b>	
<b>Coursework:</b> <i>Introduction to Bioinformatics, Computing Fundamentals, Comparative and Functional Genomics, Chemoinformatic and Chemogenomics, Systems Biology, Biochemistry, Essential Mathematics &amp; Biostatistics, Database Management System, NGS Data Analysis, Structural Bioinformatics and Drug Design, Machine Learning in Bioinformatics</i>	
University of Delhi (DU)	New Delhi, India
<b>BS in Life Science</b>	July 2018 – May 2021
	GPA: 8.848/10.00
<b>Relevant Coursework:</b> <i>Medical Diagnostics, Physiology &amp; Biochemistry, Genetics &amp; Evolutionary Biology, Bioinformatics, Animal Biotechnology, Immunology, Analytical Techniques in Plant Sciences</i>	

## Certificates

<b>Certificate of Appreciation</b> for sharing valuable knowledge and expertise as a <b>resource person</b> in “7-Days Hands-on Bioinformatics Workshop for Genomic and Proteomic Analysis”, organized by School of Allied Sciences, DEV BHOOMI UTTARAKHAND UNIVERSITY, INDIA, sponsored by DST-SERB under Karyashala Scheme, 29th January to 4th February 2024.	<b>2024</b>
<b>Certificate of Excellence</b> for Poster Presentation titled “Marine Debris: A Man-made Curse” in the <b>National Seminar</b> sponsored by ICSSR held on March 8th-9th, 2019.	<b>2019</b>
<b>Certificate of Appreciation</b> for scoring the <b>highest marks in Biology</b> (95/100), District level.	<b>2016</b>
<b>Certificate of Excellence</b> for securing a <b>10.00/10.00 CGPA</b> in the CBSE Board Examination.	<b>2014</b>
<b>Certificate of Appreciation</b> for securing <b>299th International Rank</b> , Science Olympiad.	<b>2013</b>
<b>Certificate of Appreciation</b> for securing <b>1st School Rank</b> , International English Olympiad.	<b>2013</b>

## Publications

### a) Book Chapters

- 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](https://doi.org/10.1007/978-981-99-9029-0_3)
- 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>

## b) Under Consideration/In Preparation

- Sharma, D., **Aslam D.**, Sharma K., Mittal A., & Jayaram B. (2024). *Exon-Intron Boundary Detection Made Easy by Physicochemical Properties of DNA*.

**Description:** Accurate identification of exon-intron boundaries is crucial for understanding gene expression and splicing. However, current methods for predicting exon-intron junctions have limitations due to the lack of a robust consensus sequence and reliance on experimental datasets. To address these challenges, a novel method called **ChemEXIN** has been developed. It utilizes a deep learning architecture along with structural and energetic parameters based on tri- and tetra-nucleotides. This approach takes advantage of the function-dependent local signals in structure and energy of DNA. (*Status: In Peer Review*)

GitHub: <https://github.com/rnsharma478/ChemEXIN>

Preprint DOI: <https://doi.org/10.21203/rs.3.rs-4359229/v1>

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

**Description:** 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 firmly rooted in their direct involvement in the progression of Alzheimer's disease. To bolster our findings, we concurrently conducted validation through molecular dynamics-based simulation studies, and molecular fingerprinting. (*Status: Manuscript in Preparation*)

## Research and Training Experience

Indian Institute of Technology (IIT), Delhi, India

January, 2023- Present

Role: **Project Scientist**, Computational Genomics Group (<http://www.scfbio-iitd.res.in/>)

Supervisors: **Prof. B. Jayaram & Prof. Ashok Kumar Patel**

**(a) Biophysical fingerprinting (profiling) of eukaryotic genome elements using physicochemical properties of DNA.** Underway

- Working with the hypothesis that genomic DNA sequences must convey their functional roles through their biophysical properties. We are characterizing *Genes, Promoters, Exon-start, Exon-end, Enhancers, UTRs, Codons etc.*, to differentiate them based their structure and energy profiles.

**(b) Development of a toxicity prediction model for small molecules using molecular descriptors and fingerprints.** Underway

- Collaborating with the team members from the "Drug Discovery & Proteomics Group" at SCFBio Lab to develop a toxicity prediction model for small molecules.

**(c) Development of an Intron-Exon Boundary Junction Prediction tool using physicochemical DNA features (Backbone, Base Pair (BP)-Axis, Intra BP, Inter BP, Energetics).** Completed

- Demonstrated proficiency in working with bash scripting and secure shell (SSH) usage, including remote access, file transfer, and command execution on remote systems.
- Performed a thorough literature review for the project.
- Utilized Python programming language to train/test/evaluate machine learning/deep learning (ML/DL) models and developed an exhaustive prediction pipeline.
- Displayed aptitude in large scale data handling and transformation, ensuring accurate and reliable Benchmarking results.
- Helped build the user-interactive command line utility, hosted at GitHub.

**(d) Investigation of a codon-usage-bias-based physicochemical characterization of gene/non-gene sequences.** Completed

- Collaborated closely with the senior research fellow at the SCFBio Lab to mentor a final year M.Tech. student's research project (June 2023 – June 2024).

- (a) *A Gene to Drug insight into a multitargeted inhibitor search against Alzheimer’s disease.*
- Designed and worked on a multitargeted gene-to-drug study.
  - Supported a comprehensive systematic review on Lung Cancer, providing valuable insights and assistance to the research team, along with significant contributions to two book chapters, exploring the applications of Machine Learning in various disease domains, including treatment, drug discovery, and disease progression.
  - Demonstrated proficiency in utilizing NGS (Next Generation Sequencing) pipelines on the Linux system, ensuring efficient and accurate RNA-seq data analysis.
- (b) *Investigation on the BACE1 gene and its regulatory neighbors to investigate their contribution to the progression of Alzheimer's Disease.*
- Developed and implemented custom Python/R codes to extract and preprocess essential datasets.
  - Utilized the extracted datasets to perform meticulous analysis, 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.

Professional Development

Resource Person, *Computational Genomics Group, SCFBio Lab*2024

Participated as the Resource Person 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 covering selection of sequences, distance matrices, evolutionary distance determination (multiple sequence alignment, tree building algorithms, and their evaluation).
- Demonstrated in-house tools, Chemgenome, Seq2Str, and TmPredictor.

Mentor, *Computational Genomics Group, SCFBio Lab*September, 2023- May, 2024

- Mentored an M.Tech. in Molecular Engineering, Chemical Synthesis, and Analysis student working as a Research Intern in the lab.
  - Supported with the daily laboratory tasks such as bash scripting, data handling, and data analysis.
  - Assisted with the project reports and presentations submitted as “Major Project: Part 1 and 2” progress in mid-semester evaluation and final evaluation.
  - Helped write the final draft of thesis.
- Mentored a final year Master’s (Bioinformatics) student for a two months summer internship (June 2024 – July 2024), with large scale genomic data extraction and analysis.

Peer-Review Activities, *Computational Intelligence and Bioinformatics Lab*2024

- Explainable AI in Genetics: A Case Study. In: Raza, K. (eds) Deep Learning in Genetics & Genomics. Elsevier.
- Transformer Networks and Autoencoders in Genomics and Genetic Data Interpretation: A Case Study. In: Raza, K. (eds) Deep Learning in Genetics & Genomics. Elsevier.

## Academic & 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.

Link: [1](#), [2](#)

### 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, SAC (M), DU

2020-2021

Worked alongside college administration during my undergraduate studies regarding issues related to harassment/violence within the campus.

### Member, [SAGE](#) (The Debating Society), SAC (M), DU

2018-2021

- Appointed as the *Editorial & Graphics Head*, 2020-2021.
- Formulated write-ups, and graphics for the social media accounts.
- Performed and wrote original thematic pieces and won inter-college slam poetry competitions.

### Member, [SAMVEDNA](#) (The Gender Sensitization Forum), SAC (M), DU

2019-2021

- Appointed as the *Research & Editorial Head*, 2020-2021.
- Started and published three issues of my *passion project*, "Lagniappe", a student led initiative to educate and discuss important issues with unique expressions of poetry, write-ups, and more.
- Ensured the newsletter addressed timely and relevant topics, fostering discussions on gender sensitization and other critical issues.
- Moderated book discussions and other events.

### Member of School's Cabinet

2014-2016

- Served as the *Academic Captain* of the school in twelfth grade, participating in discussions regarding academic activities and editing write-ups for the school's annual magazine (prospectus).
- Actively participated in the School's English Club discussions and activities.
- Assisted two classmates as the *Student Mentor* and helped them with daily classwork and academic development.
- Secured first position in Problem Solving Assessment (PSA) across the school.
- Volunteered in the organizing committee for several intra- and inter-school competitions.
- Participated in various debates, quizzes, and group discussions.

## Skills

**Programming:** C/C++, Python and Biopython, R, HTML, PHP, Bash Scripting

**Laboratory:** Bioinformatics Tools, C++ and Linux, MYSQL/ORACLE, Systems Biology and Advance Bioinformatics Tools, Drug Design + NGS

**Research and Development:** Machine learning/deep learning (ML/DL) model architecture handling, Benchmarking, Technical writing, Large Scale Data Handling/Analysis

**Others:** Technical Writing, Copy-editing/reviewing, Detail-oriented, Leadership, Teamwork

## References

References available upon request.