Md. Jubayer Hossain

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Research Statement

My research focuses on developing reproducible bioinformatics pipelines for large-scale bulk and single-cell RNA-seq data to uncover molecular biomarkers, immunological signatures, and therapeutic targets in cancer and neurological diseases. By integrating multi-omics data analysis, machine learning, and biology, I aim to advance computational methods that bridge biological discovery and clinical translation.

Education and Training

Master of Science in Microbiology
Jagannath University

Dhaka, Bangladesh
2019—2020

- Relevant Coursework: Genomics, Proteomics, Bioinformatics, Research Methodology and Scientific Writing

Bachelor of Science in Microbiology
Jagannath University

Dhaka, Bangladesh
2016—2019

- Relevant Coursework: Biostatistics, Public Health and Hygiene, Bioinformatics I, Bioinformatics II

Interdisciplinary Computational Biology
BRAC University

Dhaka, Bangladesh
January 2026

- Mastered high-resolution protein structure prediction and molecular visualization using AlphaFold2/3 and ChimeraX to investigate complex protein-ligand interactions
- Applied AI/ML frameworks and docking protocols to structural data from PDB and UniProt, culminating in an interdisciplinary project on predictive molecular modeling.

AI in Public Health
Child Health Research Foundation (CHRF)

Dhaka, Bangladesh
Sep 2023

- Developed predictive models and data pipelines for disease surveillance, focusing on the calculation of typhoid incidence and vaccine impact in Bangladesh.
- Built LLM-based code generation and computer vision frameworks for medical image analysis while analyzing the ethical implications of algorithmic bias.

Research Experience

Visiting Scholar
Department of Public Health, Daffodil International University

Dhaka, Bangladesh
Sep 2025 – Present

- Investigated computational frameworks within public health genomics to facilitate large-scale biomarker discovery and clinical validation.
- Developed a specialized curriculum for AI-driven disease modeling, integrating neural network architectures into biomedical informatics.
- Synthesized heterogeneous digital health records with genomic datasets to evaluate predictive models for clinical outcomes.
- Led a multidisciplinary research initiative to translate raw sequencing data into evidence-based public health insights.

Research Associate (Bioinformatics)
Bio-Bio-1:Bioinformatics Research Discussion Group

Dhaka, Bangladesh
2017 – 2019

- Analyzed genomic and transcriptomic datasets using computational tools in R and Python, with emphasis on high-throughput sequencing data.
- Designed and delivered training modules on sequence alignment algorithms, RNA-seq analysis pipelines, and data preprocessing workflows.

- Evaluated and implemented peer-reviewed bioinformatics methods for transcriptomic data, ensuring reproducibility and analytical rigor.
- Facilitated technical discussions on structural biology and next-generation sequencing (NGS) data interpretation.

Data Enumerator
Perth, Australia

School of Allied Health, Curtin University
Oct 2022 – Nov 2022

- Collected and curated quantitative and qualitative data from 40 clinicians for a Delphi study on Patient Outcomes Measurement in Interprofessional Tuberculosis Care.
- Performed rigorous data validation and cleaning, achieving 100% dataset accuracy for downstream statistical analysis.

Publications

*Note: * indicates corresponding author*

1. Fariha, F. T. J., Fuad, M., Saha, C. S., Hossen, S., & **Hossain, M. J.*** (2025). Comprehensive bioinformatics analysis reveals prognostic significance and immunological roles of WNT gene family in breast cancer. Sci Rep 15, 34490 (2025). https://doi.org/10.1038/s41598-025-13315-6

2. Ahmed, M. Z., Billah, M. M., Ferdous, J., & **Hossain, M. J.*** (2025). Pan-cancer analysis reveals immunological and prognostic significance of CCT5 in human tumors. *Scientific Reports, 15*, 14405. https://doi.org/10.1038/s41598-025-88339-z

3. Bari, S.M., Fuad, M., **Hossain, M.J.** et al. A meta-analysis of public RNA-Seq data identifies conserved stress responses in rainbow trout. BMC Genomics 26, 999 (2025). https://doi.org/10.1186/s12864-025-12127-2

4. Shanta, A. S., Islam, N., Al Asad, M., Akter, K., Habib, M. B., **Hossain, M. J.**, Nahar, S., Godman, B., & Islam, S. (2024). Resistance and co-resistance of metallo-beta-lactamase genes in diarrheal and urinary-tract pathogens in Bangladesh. *Microorganisms, 12*(8), 1589. https://doi.org/10.3390/microorganisms12081589

5. GBD 2023 Vaccine Coverage Collaborators (**Hossain, M. J.**, 2025). Global, regional, and national trends in routine childhood vaccination coverage from 1980 to 2023 with forecasts to 2030: A systematic analysis for the Global Burden of Disease Study 2023. *The Lancet*. https://www.thelancet.com/journals/lancet/article/PIIS0140-6736(25)01037-2/

6. GBD 2023 Headache Collaborators (**Hossain, M. J.**, 2025). Global, regional, and national burden of headache disorders, 1990–2023: a systematic analysis for the Global Burden of Disease Study 2023. *Lancet Neurology*. https://www.thelancet.com/journals/laneur/article/PIIS1474-4422(25)00402-8/fulltext

7. **Hossain, M. J.***, Das, M., Shahjahan, M., Islam, M. W., & Towhid, S. T. (2025). Clinical and hematological manifestation of dengue patients in 2022 outbreak: A tertiary care hospital-based cross-sectional study. *Health Science Reports, 8*, e70356. https://doi.org/10.1002/hsr2.70356

8. Das, M., & **Hossain, M. J.*** (2025). Young stroke in Bangladesh: Addressing rare cases with diagnostic challenges and much-needed solutions. *Stroke and Vascular Neurology*. https://svn.bmj.com/content/early/2025/04/07/svn-2025-004178

9. **Hossain, M. J.***, Sony, S. A., Fariha, F. T. J., & Hossen, S. (2025). Preventing the silent threat: A perspective on preparing Bangladesh for Human Metapneumovirus (HMPV). *Health Science Reports, 8*, e71101. https://doi.org/10.1002/hsr2.71101

10. **Hossain, M. J.***, Das, M., & Munni, U. R. (2024). Urgent call for compulsory premarital screening: A crucial step towards thalassemia prevention in Bangladesh. *Orphanet Journal of Rare Diseases, 19*, 326. https://doi.org/10.1186/s13023-024-03344-1

11. Islam, M. W., Shahjahan, M., Azad, A. K., & **Hossain, M. J.*** (2024). Factors contributing to antibiotic misuse among parents of school-going children in Dhaka City, Bangladesh. *Scientific Reports, 14*, 2318. https://doi.org/10.1038/s41598-024-52313-y

12. **Hossain, M. J.***, Das, M., Islam, M. W., Shahjahan, M., & Ferdous, J. (2024). Community engagement and social participation in dengue prevention: A cross-sectional study in Dhaka City. *Health Science Reports, 7*, e2022. https://doi.org/10.1002/hsr2.2022

13. **Hossain, M. J.***, Azad, A. K., Shahid, M. S. B., Shahjahan, M., & Ferdous, J. (2024). Prevalence, antibiotic resistance pattern for bacteriuria from patients with urinary tract infections. *Health Science Reports, 7*, e2039. https://doi.org/10.1002/hsr2.2039

14. Akter, M. M., & **Hossain, M. J.*** (2024). Food consumption patterns and sedentary behaviors among the university students: A cross-sectional study. *Health Science Reports, 7*, e70259. https://doi.org/10.1002/hsr2.70259

15. **Hossain, M. J.***, Islam, M. W., Munni, U. R., Gulshan, R., Mukta, S. A., Miah, M. S., Sultana, S., Karmakar, M., Ferdous, J., & Islam, M. A. (2023). Health-related quality of life among thalassemia patients in Bangladesh using the SF-36 questionnaire. *Scientific Reports, 13*(1). https://doi.org/10.1038/s41598-023-34205-9

16. Towhid, S.T., **Hossain, M. J.**, Sammo, M.A.S., & Akter, S.Perception of Students on Antibiotic Resistance and Prevention: An Online, Community-Based Case Study from Dhaka, Bangladesh. European Journal of Biology and Biotechnology, https://doi.org/10.24018/ejbio.2022.3.3.341

17. **Hossain, M. J.**, Towhid, S.T., Sultana, S., Mukta, S.A., Gulshan, R., Miah, M.S. Knowledge and Attitudes towards Thalassemia among Public University Students in Bangladesh. Microbial Bioactives, 5(2). https://doi.org/10.25163/microbbioacts.526325

Papers Under Review

1. Islam, M. W., Rahman, M. M., Naznin, H., Hossain, M. S., Akter, T., Shatabde, Z. A., & **Hossain, M. J.*** (2025). Integrative bioinformatics analysis reveals COL13A1 and COL23A1 as potential diagnostic and prognostic biomarkers in thyroid cancer. [Submitted to Health Science Reports].

2. Islam, M. W., Fariha, F. T. J., Ahmed, M. Z., Ferdous, J., Lota, H. B., Hossain, M. S., Kundu, P., Shahjahan, M., & **Hossain, M. J.*** (2025). Bioinformatics-driven multi-omics profiling of CDK1 and CDK6 identifies prognostic and therapeutic roles in breast cancer.[Under Review in Health Science Reports].

3. Billah, M. M., Mabsurah, K., Ahammad, K., Yeana, I. J., Sumaiya, M., Islam, T., Bhattacharjee, A., Ferdous, J., & **Hossain, M. J.*** (2025). Multi-omics pan-cancer analysis reveals an immunological role and prognostic potential of WDR76. [Under Review in Discover Oncology].

4. Sony, S. A., Kundu, L. R., Limon, M. H., Chowdhury, T. B. K., & & **Hossain, M. J.*** (2025). Predicting early antenatal care initiation at the first trimester among reproductive women in Bangladesh using machine learning. [Under Review in BMC Pregnancy and Childbirth].

5. **Hossain, M. J.***, Shahariar, M., Barsha, LHJ. Shahjahan, M., Towhid, ST., Sheikh, MK., Hasan, MM., Rahman, MH., Sazid, MS. (2024). Lack of knowledge and training about antibiotic resistance among community pharmacists in Bangladesh: a cross-sectional study. [Under Review in Health Science Reports].

Working Papers

1. **Fezf2-Mediated Cortical Development: Multi-Omics Analysis**. Integrative analysis of bulk and single-cell RNA-Seq data to elucidate Fezf2's role in cortical neurogenesis. *Tech:* Python, Seurat, Scanpy, DESeq2 *GitHub:* https://github.com/hossainlab/fezf2-multiomics

2. **Single-Cell Meta-Analysis of Microglial Activation in Alzheimer's Disease**. Meta-analysis of single-cell RNA-Seq datasets to identify microglial states and activation patterns in Alzheimer's disease. *Tech:* Python, Scanpy, R/Seurat, Harmony, scVI-tools *GitHub:* https://github.com/hossainlab/alzheimers-microglia-meta-analysis

3. **Integrative Spatial-scRNA-seq Atlas of Immunotherapy Resistance Mechanisms Across Cancer Types**. Comprehensive spatial transcriptomics and single-cell analysis to map tumor microenvironment and resistance mechanisms in immunotherapy. *Tech:* Python, Scanpy, Seurat, Squidpy, SpatialData, scVI-tools *GitHub:* https://github.com/hossainlab/spatial-scRNA-immune-resistance

Conferences

Note: †Indicates a presenter, ‡indicates a co-author, and *indicates a corresponding author*

Poster Presentations

1. [+]Hossain, M. J., Das, M. (2024). Diagnostic and Electrophysiological Features of Hirayama Disease in Young Adult Male: A Case Report. International Conference of Public Health, Institute of Epidemiology, Disease Control and Research (IEDCR), Dhaka, Bangladesh

2. [+]Das, M., Kajol, M. M., Mim, N. A., Maruf, M. F. I., Hirko, K., [*]**Hossain, M. J.** (2024). Level of knowledge regarding breast cancer and breast self-examination among school and college-going girls in Bangladesh: A cross-sectional study. International Conference of Public Health, Institute of Epidemiology, Disease Control and Research (IEDCR), Dhaka, Bangladesh

3. Shahariar, M., Joarder Barsha, L. H., [+]Shahjahan, M., Towhid, S. T., Sheikh, M. K., Hasan, M. M., Rahaman, M. H., Sazid, M. S., [*]**Hossain, M. J.** (2024). Lack of knowledge and training about antibiotic resistance among community pharmacists in Bangladesh: A cross-sectional study. International Conference of Public Health, Institute of Epidemiology, Disease Control and Research (IEDCR), Dhaka, Bangladesh

4. [+]Afrin, N., Howlader, G., Bhattacharjee, A., Akter, N., Mesu, M. H., Mazumder, E., [*]**Hossain, M. J.** (2024). Influence of Meteorological Factors on Dengue Incidence: A 23-Year Retrospective Analysis in Bangladesh. International Conference of Public Health, Institute of Epidemiology, Disease Control and Research (IEDCR), Dhaka, Bangladesh

5. [+]Akter, N., Mim, N. A., [*]**Hossain, M. J.** (2024). Particulate Matter PM2.5 Pollution and Air Quality Index (AQI) Trends Evaluation with Meteorological Factors in Dhaka City. International Conference of Public Health, Institute of Epidemiology, Disease Control and Research (IEDCR), Dhaka, Bangladesh

Oral Presentations

1. [+]Tuhin, M. A. A., Mim, N. A., Akter, N., Jamal, F., Sakib, M. N., Mehjabin, K., [*]**Hossain, M. J.** (2024). Exploring the Factors Influencing Heat Stress Risks Using the Discomfort Index Method in Bangladesh. International Conference on Environmental Science and Resource Management 2024 (ICESRM 2024), Department of Environmental Science and Resource Management, Mawlana Bhashani Science and Technology University, Bangladesh.

2. Mim, N. A., Akter, Tuhin, M. A. A., [+]Hossain, S., Alam, K. E., Mouli, N. J., [*]**Hossain, M. J.** (2024). Temporal Trends and Factors Influencing Diarrhea Prevalence Among Children in the Rangamati Hill Tract Region: A Time Series Analysis. International Conference on Environmental Science and Resource Management 2024 (ICESRM 2024), Department of Environmental Science and Resource Management, Mawlana Bhashani Science and Technology University, Bangladesh.

3. Nayeem, M. U., Mrittika, M. A., [‡]**Hossain, M. J.**, Azad, A. K., Ferdous, J., Ahmed, S., Sanyal, S. K., Towhid, S. T. (2023). Quantitative Microbial Risk Assessment from Vancomycin-Resistant Enterococcus faecalis and Enterococcus faecium from a Specific Neighborhood in Dhaka City, Bangladesh. 36th Bangladesh Society of Microbiologists Annual Conference, Shahjalal University of Science and Technology (SUST), Sylhet, Bangladesh, January 2023.

4. [‡]**Hossain, M. J.**, [+]Habiba, U., Rozario, C., Tuhin, M. L. A., Mabsurah, K., Uddin, N. F. (2023). Factors influencing heat stress risk in Bangladesh. 9th International Public Health Conference by Public Health Foundation at Bangladesh Medical Research Council (BMRC), Bangladesh, November 2023.

5. [‡]**Hossain, M. J.**, [+]Nowshin, N., Momtaj, Yeana, I. Y., Nohor, N. (2023). Monitoring Water-Borne Disease (Vibrio cholerae) using NASA Earth observation data. 9th International Public Health Conference by Public Health Foundation at Bangladesh Medical Research Council (BMRC), Bangladesh, November 2023.

Teaching Experience

Lead Organizer & Instructor
Dhaka, Bangladesh

DeepBio Academy, Bioinformatics and Computational Biology
June 2020 – Present

- Designed comprehensive bioinformatics curriculum specializing in Single-Cell RNA-seq (scRNA-seq) workflows and multi-omic data integration.

- Benchmarked computational tools for transcriptomics and genomics to ensure pipeline reproducibility and analytical rigor.
- Supervised a technical research team in processing high-throughput omics datasets to identify transcriptional drivers of disease.
- Mentored undergraduate studente in the development of computational research portfolios, emphasizing open-science standards and version control.

Faculty (Bioinformatics)
University of Dhaka (cBLAST)

Dhaka, Bangladesh
Aug 2023 – Present

- Instructed specialized modules in Biomedical Machine Learning, focusing on the application of Python-based neural networks to sequence analysis.
- Directed student research projects applying deep learning frameworks to identify regulatory elements in complex biological datasets.
- Facilitated technical practicums for 100+ trainees on scalable data science methodologies for high-throughput genomic data.
- Evaluated computational frameworks for performance, establishing rigorous criteria for the optimization of biological models.
- Bridge theoretical computational principles with experimental biology to foster collaborative research outputs.

Program Lead
GSA Bioinformatics Internship

Dhaka, Bangladesh
July 2025 – Dec 2025

- Conducted a pan-cancer transcriptomics meta-analysis across four organ systems to identify conserved regulatory networks in tumorigenesis.
- Optimized high-throughput pipelines for Bulk and Single-Cell RNA-seq, implementing advanced batch-effect correction and normalization protocols.
- Mentored research interns in the utilization of High-Performance Computing (HPC) environments and R/Bioconductor analytical frameworks.
- Analyzed complex transcriptional networks using Gene Set Enrichment Analysis (GSEA) to uncover novel oncogenic drivers.
- Managed collaborative research workflows across three institutions, resulting in the generation of peer-reviewed conference abstracts.

Teaching Assistant
Department of Microbiology, Jagannath University

Dhaka, Bangladesh
Oct 2022 – Dec 2022

- Assisted in the delivery of research methodology training, focusing on experimental design and statistical power in public health microbiology.
- Processed public health surveillance data to support departmental research on emerging epidemiological trends.
- Critiqued and refined student research proposals to ensure compliance with modern computational and microbiological standards.
- Communicated complex biological theories through technical presentations to diverse academic audiences.
- Implemented digital data-tracking systems to monitor research milestones and student performance metrics.

Leadership Experience

Founder, Bioinformatics Scientist & CEO
DeepBio Limited

Dhaka, Bangladesh
Jan 2025 – Present

- Lead a team of 13 researchers executing scRNA-seq and bulk RNA-seq analysis pipelines for cancer genomics and transcriptomics projects.
- Develop and benchmark scalable bioinformatics workflows for biomarker discovery in cancer and neurodegenerative diseases.
- Build and maintain AI-integrated computational infrastructure for multi-omics data processing and interpretation.
- Develop and deliver a national training program in computational biology, upskilling undergraduate researchers across Bangladesh.

Founder & Capacity Building Director
CHIRAL Bangladesh (Non-profit Research Institute)

Dhaka, Bangladesh
June 2020 – Present

- Founded and lead a research institute with dedicated divisions in Bioinformatics, Public Health, Geospatial Health, and AI-Healthcare.

- Published 20+ peer-reviewed articles in Q1/Q2 journals and 40+ conference papers in health informatics and computational biology.
- Supervised 15+ manuscripts through analytical development and peer-review preparation in global health and bioinformatics.
- Collaborated with Michigan State University on biomedical research capacity-building initiatives in South Asia.
- Trained 3,000+ early-career researchers in data science, research methodology, and computational biology workflows.

Community Engagement

Nextflow Ambassador
Barcelona, Spain

Seqera
2025 – Present

- Advocated for the adoption of Nextflow-based DSL2 pipelines to ensure reproducibility and scalability in high-throughput single-cell and bulk RNA-seq workflows.
- Engineered technical tutorials and documentation for the deployment of portable scientific containers (Docker/Singularity) in cloud and HPC environments.
- Optimized community-driven bioinformatic workflows, focusing on the integration of standardized pipelines for large-scale transcriptomic data processing.
- Facilitated technical workshops on workflow orchestration, training researchers to manage complex multi-omic datasets with high analytical rigor.
- Collaborated with global health data scientists to implement best practices for version-controlled, open-source computational research.

GBD Senior Collaborator
Washington, USA

Institute for Health Metrics and Evaluation
2025 – Present

- Contributed advanced statistical modeling and analytical validation to Global Burden of Disease (GBD) studies published in high-impact journals like The Lancet.
- Synthesized and audited complex epidemiological datasets from 190+ countries to strengthen the robustness of global health genomic evidence.
- Formulated predictive models for disease burden, utilizing large-scale data integration techniques to identify health trends across diverse populations.
- Evaluated the quality and consistency of multi-national health data, ensuring high-fidelity inputs for global health policy frameworks.
- Collaborated with international research cohorts to refine statistical methodologies for assessing neurological and metabolic disease prevalence.

Courses Taught

1. **Biomedical Machine Learning with Python**. Applied machine learning frameworks for biomedical data analysis and predictive modeling. *Institution:* cBLAST, University of Dhaka

2. **Data Science and Machine Learning for Biologists**. Comprehensive training in data science workflows and ML applications for biological research. *Institution:* cBLAST, University of Dhaka

3. **AI for Public Health**. Modules on AI applications in disease modeling, digital health, and biomedical informatics. *Institution:* Micro-Credentials Academy, Daffodil International University

4. **Transcriptomics Data Analysis (Bulk + Single-Cell Analysis)**. Comprehensive training in bulk and single-cell RNA-seq data analysis workflows and interpretation. *Institution:* DeepBio Limited

5. **Biomarker Identification using Machine Learning**. Machine learning approaches for discovering and validating biomarkers from omics datasets. *Institution:* DeepBio Limited

6. **Pan-Cancer Bioinformatics with R: Ideation to Publication**. End-to-end research workflow from hypothesis generation to publication using R and bioinformatics tools. *Institution:* DeepBio Limited

7. **AI in Drug Discovery: In Silico Toxicology Modeling**. Computational approaches for drug discovery and predictive toxicology modeling using AI. *Institution:* DeepBio Limited

8. **Single-Cell Cancer Genomics**. Advanced methods for analyzing single-cell genomic data in cancer research contexts. *Institution:* DeepBio Limited

9. **Bioinformatics and Integrative Genomics (BIG)**. Integration of cancer genomics, neurogenomics, computer-aided drug design and AI for life sciences in bioinformatics research applications. *Institution:* DeepBio Limited

10. **BRAIN – Bioinformatics Research with AI in Neurosciences**. Specialized course on applying AI and bioinformatics methods to neuroscience research. *Institution:* DeepBio Limited

Research Mentoring

Bulk RNA-Seq Meta-Analysis of Liver, Kidney, Pancreatic, and Gastrointestinal Cancers for Biomarker and Immune Signature Discovery (July 2025 - present)

- **Rahnuma Tabassum** (Biochemistry & Molecular Biology, Jagannath University) - Liver Cancer
- **Fayez Ahmad** (Notre Dame College) - Esophageal Cancer
- **Sabbir Khan** (Doctor of Veterinary Medicine, Gazipur Agricultural University) - Kidney Cancer
- **Md Shakil Ahamed** (Biotechnology & Genetic Engineering, Mawlana Bhashani Science & Technology University) - Colon Cancer
- **Lamisa Manha Aditee** (Biotechnology, BRAC University) - Pancreatic Cancer

Bioinformatics Workflows

1. **Bulk RNA-Seq Meta-Analysis Pipeline**. Nextflow-based pipeline for meta-analysis of public RNA-Seq data with automated QC and differential expression. *Tech:* Nextflow, nf-core, Python, R/Bioconductor, Docker *GitHub:* https://github.com/hossainlab/nf-core-rnaseqmeta

2. **Single-Cell Meta-Analysis Pipeline**. Pipeline for single-cell RNA-Seq integration, cell type annotation, and batch correction. *Tech:* Python, Scanpy, R/Seurat, Harmony, scVI-tools *GitHub:* https://github.com/hossainlab/sc-meta-analysis-pipeline

3. **Salmon RNA-Seq Quantification Pipeline**. End-to-end pipeline for ultra-fast transcript quantification and quality assessment. *Tech:* Salmon, FastQC, MultiQC, R/Bioconductor *GitHub:* https://github.com/hossainlab/salmon-rnaseq

4. **Biomarker Identification using Machine Learning**. ML framework for biomarker discovery with feature selection and model interpretability. *Tech:* Python, Scikit-learn, XGBoost, SHAP *GitHub:* https://github.com/hossainlab/biomarker_identification

5. **GEO Differential Expression & ML Dataset Prep**. Automated GEO data retrieval, differential expression analysis, and ML dataset generation. *Tech:* R/Bioconductor, Python, GEOquery, limma, DESeq2 *GitHub:* https://github.com/bigbiolab/geo_ml

6. **16S rRNA Microbiome Analysis Pipeline**. Comprehensive microbiome pipeline combining QIIME 2 and DADA2 for taxonomic profiling. *Tech:* QIIME 2, R/DADA2, Phyloseq, VSEARCH *GitHub:* https://github.com/hossainlab/16S-pipeline

GenAI Projects

1. **DeepTrust AI (Prototype)**. AI-powered tool to detect and counter health misinformation with NLP and credibility scoring features. *Tech:* Python, NLP, Transformers, FastAPI, Streamlit *Demo:* https://deeptrustai.deepbioltd.com

2. **GenMed AI (Prototype)**. AI-driven platform accelerating drug discovery through disease data analysis, protein target identification, and therapeutic compound generation. *Tech:* Python, BioPython, RDKit, DeepChem, Transformers, PyTorch *Demo:* https://genmedai.deepbioltd.com

Invited Talks

1. **Computational Biology and Bioinformatics Research in Resource-Limited Settings: Strategies, Tools and Opportunities** (2025). Speaker, Jagannath University Higher Study and Research Society. In this talk, I

delivered the strategies and techniques essential for mastering computational biology and bioinformatics research.

2. **Mastering Biomedical Data Management** (2024). Speaker, IFMSA Bangladesh, Dhaka, Bangladesh. In the era of big data and advanced technologies, the management of biomedical data presents both immense opportunities and significant challenges. In this talk, I explored the strategies and techniques essential for mastering biomedical data management.

3. **Undergraduate Research - Importance, Benefits, and Challenges** (2022). Speaker, CHIRAL Bangladesh, Dhaka, Bangladesh. This talk was designed to enhance the undergraduate research experience by focusing on critical communication skills for success in research and broad transferable professional skills.

4. **State the Art of Microbial Genome Analysis** (2022). Speaker, Jagannath University, Dhaka, Bangladesh. This talk was about the art of genomic data analysis. I explored genomic data analysis steps typically include data collection, quality check and cleaning, processing, modeling, visualization and reporting.

Media Coverage

1. **"Parental lack of antibiotic knowledge imperils child health in Bangladesh: Study"**. The Business Standard (TBS), 2024. Featured research on antibiotic misuse among 63% of parents in Dhaka.

2. **"What the rise in self-medication tells us about the country's healthcare system"**. The Business Standard (TBS), 2024. Expert commentary on self-medication practices and healthcare system gaps.

References

Dr. Syeda Tasneem Towhid
Associate Professor
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Jagannath University
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Dr. Md. Salequl Islam
Professor
Department of Microbiology
Jahangirnagar University
Email: salequl@juniv.edu

Dr. Zeba Islam Seraj
UGC Professor
Department of Molecular Biology and Biochemistry
University of Dhaka
Director, cBLAST
Email: zebai@du.ac.bd