# Md. Jubayer Hossain

Bioinformatics Researcher · Transcriptomics (Bulk & Single-Cell RNA-Seq) and AI in Biology

*132/3, Azimpur, Dhaka, Bangladesh*

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## 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

### Specialized Training: AI in Public Health
Child Health Research Foundation (CHRF)

*Dhaka, Bangladesh*
*2023*

- Acquired Skills: Epidemiological Modeling, Disease Surveillance using AI, Time Series Analysis (LSTM, ARIMA), Medical Image Analysis (X-ray, MRI)

## Research Experience

### Visiting Researcher
Department of Public Health, Daffodil International University

*Dhaka, Bangladesh*
*2025– Present (Part-time)*

- Collaborated with DIU faculty and students on ongoing research projects, grant proposals, and publications in public health and health informatics, resulting in 2 manuscripts under preparation.
- Delivering workshops, online courses, and research mentorship to strengthen capacity building in public health research.

### GBD Collaborator

*Washington, USA*
*2025– Present (Part-time, Voluntary)*

Institute for Health Metrics and Evaluation

- Contributed critical analytical feedback and statistical modeling to 4 Global Burden of Disease (GBD) studies, including one on routine childhood vaccination coverage published in The Lancet.
- Supported manuscript development and provided methodological input for 3 ongoing high-impact GBD papers (breast cancer, headache disorders, and mental disorders), all currently under peer review.
- Enhanced epidemiological insights by integrating and validating datasets from 190+ countries, improving the robustness of global health policy evidence.

### Research Intern
International Center for Diarrhoeal Disease Research, Bangladesh

*Dhaka, Bangladesh*
*Feb 2022—Jun 2022*

- Designed and implemented a comprehensive search strategy across PubMed, Embase, and PsycINFO, screening 8,000+ articles to support a systematic review on intimate partner violence in South Asia.
- Streamlined the abstract screening process in Covidence, identifying 400+ potentially relevant studies.
- Conducted full-text screening of 120+ articles and extracted key variables for meta-analysis.
- Drafted a systematic review protocol based on PRISMA guidelines, ensuring methodological transparency and reproducibility.

### Data Enumerator
School of Allied Health, Curtin University

*Australia*
*Oct 2022—Nov 2022*

- Collected both quantitative and qualitative data from 40 Bangladeshi doctors for a Delphi study on Patient Outcomes Measurement in Interprofessional Tuberculosis Care.
- Validated and cleaned all survey responses, achieving 100% accuracy in the final dataset.
- Enhanced the reliability of study outcomes by ensuring high-quality and complete data capture.

### Team Member
*Australia*
*2017—2019*

Bio-Bio-1: Bioinformatics Research Discussion Group

- Engaged in collaborative research discussions and pursued continuous learning opportunities in bioinformatics.
- Contributed to the design of training modules and preparation of learning content to support group activities.
- Took initiative in team projects and developed leadership skills through active participation.

## Leadership Experience

### Founder & Chief Executive Officer
*Dhaka, Bangladesh*
*2025 - Present (Self-employed)*

DeepBio Limited (C-202963/2025)

- Founded and lead a bioinformatics company specializing in cancer genomics, transcriptomics, and AI-driven healthcare solutions.
- Recruited and manage a multidisciplinary team of 13 scientists (4 CADD Scientists I, 5 Bioinformatics Scientists I, 4 Computational Biologists) to drive computational biology and bioinformatics research.
- Developed and implemented scalable bulk RNA-seq and single-cell analysis pipelines, enabling translational medicine and biomarker discovery for cancer and neurodegenerative diseases.
- Launched a professional training program in bioinformatics and computational biology, training 40 students across Bangladesh, Pakistan, India, and African countries to strengthen the regional talent pipeline.
- Established collaborations with academic and industry partners to expand computational biology research capacity in South Asia.

### Founder & Executive Director
*Dhaka, Bangladesh*
*2020 - Present (Self-employed)*

Center for Health Innovation, Research, Action, and Learning - Bangladesh

- Founded and expanded a non-profit research institute empowering young scientists in public health, bioinformatics, geospatial health, and AI for health, now structured into 4 research divisions.
- Trained over 3,000 undergraduate students nationwide on the fundamentals of research methods, data science, and scientific writing.
- Published 20+ peer-reviewed articles in international journals (Q1, Q2) and presented 40+ conference papers, advancing knowledge in public health, bioinformatics, and health informatics.
- Guided the preparation of 15+ manuscripts currently under peer review, strengthening the pipeline of early-career researcher contributions.
- Secured collaborative partnerships with Thalassemia Foundation Bangladesh, One Health Lab, Jahangirnagar University and Sher-e-Bangla Agricultural University, and Michigan State University to foster capacity building in biomedical research across Bangladesh.

## Teaching and Mentoring

### Instructor
*Dhaka, Bangladesh*
*2025 - Present (Part-time)*

Micro-Credentials Academy, Daffodil International University

- Designed and delivered modules on AI for disease modeling, digital health, and biomedical informatics
- Coordinated training programs that reached diverse student groups, bridging computing and health sciences

### Lead Organizer & Instructor
*Dhaka, Bangladesh*
*2025 - Present (Part-time)*

Professional Training in Bioinformatics and Computational Biology

- Developed a year-long, university-style program covering genomics, transcriptomics, single-cell RNA-seq, and AI in health, with 40 students enrolled from Bangladesh, Pakistan, India, and African countries.
- Led a team of 4 instructors and 8 teaching assistants and created real-world case study curricula, preparing students for professional research careers in bioinformatics and computational biology.

### Program Lead
*Dhaka, Bangladesh*
*2025 - Present (Part-time)*

GSA Bioinformatics Internship

- Designed and taught a hands-on bioinformatics curriculum (Bash, R, RNA-seq, scRNA-seq) for interns annually.
- Mentored 5 research interns on an original project: Comparative pan-cancer transcriptomics meta-analysis, which uncovered shared and distinct transcriptional networks with pathway crosstalk in liver, kidney, pancreas, and gastrointestinal cancers for biomarker and therapeutic target discovery.

- Guided interns in RNA-seq meta-analysis, coding, and scientific communication, leading to conference abstracts and manuscript preparation.

### Faculty

*Dhaka, Bangladesh*

Center for Bioinformatics Learning Advancement and Systematics Training, University of Dhaka      *2023 - Present (Part-time)*

- Designed and delivered specialized courses in Biomedical Machine Learning with Python (20 trainees), Data Science and Machine Learning for Biologists (100+ enrolled), and School of Bioinformatics (15 trainees).
- Supervised student research projects applying ML frameworks to biomedical datasets, guiding participants toward publication-ready outputs and conference presentations.

### Teaching Assistant (TA)

*Dhaka, Bangladesh*

*Oct 2022 - Dec 2022 (Part-time)*

Department of Microbiology, Jagannath University

- Assisted in preparing and delivering lectures, course materials, and assessments for 40 undergraduate students in Public Health & Hygiene.
- Mentored students on a public health project, providing guidance on research design, data analysis, and presentation skills.
- Supported faculty in student evaluation and academic advising, fostering stronger student engagement with departmental activities.

## Selected Publications

(*Note: * indicates corresponding author; full list of publications availablet at https://mdjubayerhossain.com/)

Peer-reviewed

1. 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

2. 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

3. 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

4. Bari, S. M., Fuad, M., & **Hossain, M. J.**\* (2025). Transcriptomic insights into heat and hypoxia stress in rainbow trout: A meta-analysis of public RNA-Seq data [Preprint]. *Research Square*. (Accepted by *BMC Genomics*) https://doi.org/10.21203/rs.3.rs-6710656/v1

5. GBD 2023 Vaccine Coverage Collaborators. (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/

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. [Under Review in 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. Mabsurah, K., Yeana, I. J., Sumaiya, M., Islam, T., Ahammad, K., Bhattacharjee, A., Ferdous, J., Billah, M. M., & **Hossain, M. J.**\* (2025). Pan-cancer analysis identifies potential prognostic and immunological role of RAS-degrading WDR76 in human tumors. [Under Review in Discover Oncology].

Conferences

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. 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.

## 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.

## Projects

**DeepTrust AI (Prototype)**                    *Dhaka, Bangladesh*
https://deeptrustai.deepbioltd.com/                    *DeepBio Limited*

- Led the development of DeepTrust AI, an AI-powered tool designed to detect and counter health misinformation, addressing a critical public health challenge in Bangladesh.
- Built and showcased a functional prototype with natural language processing and credibility scoring features.

**GenMed AI (Prototype)**                    *Dhaka, Bangladesh*
https://genmedai.deepbioltd.com/                    *DeepBio Limited*

- Directed the design of GenMed AI, an AI-driven platform to accelerate drug discovery by analyzing disease data, identifying protein targets, and generating therapeutic compound designs within minutes instead of years.
- Developed prototype models integrating bioinformatics pipelines and generative AI frameworks.

## Skills

### Programming & Data Science
Python, R, Julia, SQL; PyTorch, TensorFlow, scikit-learn, PyCaret

### Bioinformatics
Bulk RNA-seq (FastQC, STAR, HISAT2, Salmon, Kallisto, DESeq2); Single-cell RNA-seq (Seurat, Scanpy, CellRanger); Nextflow, Docker

### Multi-omics Integration
Harmony (integration)

### Other Tools
UNIX/Linux, Git

# References

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