

MD. HRIDOY AHMED

MSc Graduate in Functional Genomics & Molecular Biology
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PROFILE SUMMARY

MSc graduate in Genetic Engineering and Biotechnology with strong training in functional genomics and molecular biology. Experienced in integrating wet lab experiments with computational analysis to study genetic variants and disease mechanisms. Interested in imaging driven investigation of cellular dynamics and translation of molecular signals into spatial tissue level phenotypes. Eager to contribute to interdisciplinary research combining cell biology, bioinformatics, and advanced imaging approaches.

EDUCATION

MSc (Research) in Genetic Engineering and Biotechnology (GEB)

- University of Chittagong (CU), Bangladesh 2023 – 2025
- Grade obtained: CGPA **3.94** out of 4.00 (Rank: *2nd* out of 40 students)
- Thesis Title :** Study on the association of *MMP3* and *MMP9* gene polymorphisms with disease susceptibility: genetic and environmental insights into periodontitis and diabetes.
- Identified *MMP3* rs520540 as a significant risk allele with genotype-specific modulation of inflammatory tissue destruction in a Bangladeshi clinical cohort

BSc (Hons) in Genetic Engineering and Biotechnology (GEB)

- University of Chittagong (CU), Bangladesh 2019 – 2022
- Grade obtained: CGPA **3.89** out of 4.00 (Rank: *4th* out of 40 students)

PUBLICATIONS (FIRST AUTHOR)

- Ahmed, M.H.**, M. M.Khan, S.Dutta, et al. (2026). Molecular Pharming: Advances, Applications, and Future Prospects in Biotechnology and Medicine. *Engineering in Life Sciences*, 26, no. 3, e70075. DOI: <https://doi.org/10.1002/elsc.70075>
- Ahmed, M.H.**, Singh, G., Castrosanto, M., et al. (2023). A structure-based drug design approach for the identification of antiviral compounds targeting the chikungunya virus RdRp protein. *Chemical Physics Impact*, 8, 100450. DOI: <https://doi.org/10.1016/j.chphi.2023.100450>
- Ahmed, M.H.**, Samia, N. S. N., Singh, G., et al. (2023). An immuno-informatics approach for annotation of hypothetical proteins and multi-epitope vaccine designed against the Mpox virus. *Journal of Biomolecular Structure and Dynamics*, 42(10), 5288-5307. DOI: <https://doi.org/10.1080/07391102.2023.2239921>

Under Review (1st author position only):

- Novel variants in *MMP-3* and *MMP-9* genes associated with periodontitis and diabetes in Bangladeshi population (Submitted to *Journal of Diabetes and Its Complications*, 2026)
- Epitope mapping for *C. trachomatis* and *S. pyogenes* (Submitted to *PLOS One*, 2026)
- GWAS-based variant annotation in breast cancer (Submitted to *Scientific Reports*, 2026)

RESEARCH EXPERIENCE

Research Associate(40hrs/week), Functional Genomics & Proteomics Lab, Jan 2025 – Present

- Principal investigators: Dr. Laila Khaleda Anghi & Dr. Mohammad Al-Forkan

Project Lead:

- Role of *OXTR* and *SNAP-25* Gene Polymorphisms in **Autism Spectrum Disorder**.

2. Identification of novel variants of the *MMP2*, *MMP3*, and *MMP9* genes associated with **osteoporosis, periodontitis and diabetes**, and discovery of potential drug candidates (**N=100 samples**).

Research Assistant(35hrs/week), Functional Genomics & Proteomics Lab, Jan 2024 – Dec 2024

- **Supervisors:** Dr. Laila Khaleda Ankhi & Dr. Mohammad Al-Forkan
- Applied functional genomics and proteomic approaches to investigate molecular processes associated with neurodevelopment, tissue inflammation and extracellular remodelling.
- Collected biological sample, isolated DNA, Sanger sequenced and identified mutations, and Variants.

Research Intern(40hrs/week), National Institute of Biotechnology Nov 2023 – Dec 2023

- Training in Sanger and next-generation sequencing.
- Carried out DNA amplification and visualization techniques.

Summer Research Intern(35hrs/week), Alternative Medicine Research Lab Jul 2023 – Oct 2023

- **Supervisor:** Dr. Md. Atiar Rahman
- Extracted and characterised natural bioactive phytochemicals with potential therapeutic activity.
- Evaluated biological activity using experimental animal models.
- Performed molecular docking and molecular dynamics simulations to identify anticancer target interactions including p53 signalling pathways.

Undergraduate Project, Bioinformatics Lab, University of Chittagong Aug 2022 - Dec 2022

- **Supervisor:** Dr. Adnan Mannan
- Performed molecular docking and molecular dynamics simulations of bioactive compounds using GROMACS and PyRx to inhibit Chikungunya virus RdRp protein.
- Conducted trajectory analysis including HOMO-LUMO, RMSD, RMSF, hydrogen bonding, and binding stability, to assess system dynamics.

RESEARCH TECHNIQUES AND COMPUTATIONAL SKILLS

- **Wet Lab:** Animal model handling, DNA/RNA Extraction from human/microbial samples, Electrophoresis, RFLP, PCR/RT-qPCR Sanger/NGS, ELISA, Western Blotting, Microscopy.
- **Transcriptomics and Bioinformatics:** FASTQC, Hisat2, Trimmomatic, SAMtools, DESeq2, Cytoscape.
- **Structural Biology & Molecular Modelling:** Homology Modelling (SwissModel, AlphaFold2), Molecular docking (AutoDock, PyRx), Molecular dynamics simulations (GROMACS), Protein-ligand interaction analysis, Trajectory analysis (RMSD, RMSF, hydrogen bonds), Structural visualization (PyMOL, UCSF ChimeraX)
- **Programming & Data Analysis:** Python, R, Bash, LaTeX, SPSS, Graphpad Prism, FlowJo, Excel.

GRANTS & FELLOWSHIPS

National Science and Technology Fellowship 2025

- In the top 5% graduate researcher nationwide - issued by the Ministry of Science & Technology, Bangladesh.

AWARDS & HONORS

- **Academic Excellence Award**, issued by the University of Chittagong 2025
- **Best Research Presenter** (1st place out of 58+) Darwin International Conference, India 2024
- **Best Poster Presenter**, Dept. of GEB, University of Chittagong 2023

- **Best Campus Representative**, 7th International Conference on Natural Science and Technology 2023

CONFERENCE PRESENTATIONS

Selected Oral Presentations (Top 03):

- **Invited Talk**, University of Chittagong – Insights into computer-aided drug design 2025
- **Champion** - Darwin International Conf., India – Vaccine design against Monkeypox virus 2024
- ICSB-RSG Symposium – Epitope screening for Chikungunya 2023

Selected Poster Presentations (Top 03):

- **Champion** - DNA Day Poster Competition – Reverse Vaccinology Against *S. pyogenes* 2023
- Chittagong University Research and Higher Studies Society – Plant molecules vs. Marburg Virus 2023
- International Islamic University – Investigation of Plant Molecules as MPXV Inhibitors. 2023

LEADERSHIP & SERVICE

- **Head Coordinator**, Bioinformatics Olympiads (1st and 2nd cohort) 2022, 2023
- **Event Organizer**, Bangladesh Biology Olympiad (Chattogram Region) 2022, 2024
- **Program Manager**: Community of Biotechnology, Bangladesh 2023

PROFESSIONAL DEVELOPMENT

- Training on Sanger & Next Generation Sequencing – FGPL, University of Chittagong 2025
- Advanced Bioinformatics and OMICS data analysis – NextGenHelper, India 2024
- Linux & Bash for Biologists – Bioscience Factory, Bangladesh 2023

TEACHING & OUTREACH

Chief Instructor & Project Mentor, BioPC Lab 2022 – Present

- Designed & mentored 6 research projects, trained 3000+ students
- Organized 2 nationwide Olympiads and 10 workshops

Global Outreach Member, American Society for Microbiology 2025 – Present

Instructor, Unique Coaching Center, Biology and Chemistry 2020 – 2022

LANGUAGE PROFICIENCY

- **English** — IELTS Academic 7.5 | No Band Less Than 6.5 Nov 2025

REFERENCES

Dr. Laila Khaleda Ankhi

Professor & Chair, Dept. of Genetic Engineering and
Biotechnology, University of Chittagong
laila.khaleda@fgplgeb.com | +8801742809249
Relation: MS Thesis Supervisor

Dr. Mohammad Al-Forkan

Founder & Professor, Dept. of Genetic Engineering
and Biotechnology, University of Chittagong
mohammad.al-forkan@fgplgeb.com | 01819383213
Relation: MS Thesis Co-Supervisor