

Md Atikur Rahman

Otto-Miltzer-Straße 1, 07747, Jena, Germany.
md.atikur.rahman@uni-jena.de +493641949464

Education

Master of Science in Microbiology

Friedrich-Schiller University Jena (FSU), Germany

Relevant coursework: Microbial Interactions, Microbial Communication, Molecular Communication in Basidiomycetes, Microbial Physiology

Dissertation: Validation and characterization of novel small protein candidates of *Vibrio cholerae*

Master of Science in Microbiology

Jahangirnagar University (JU), Bangladesh

Relevant coursework: Applied Environmental Microbiology, Molecular Microbiology, Genomics and Bioinformatics, Extremophiles and their Novel Products

Dissertation: Antibacterial activity screening of *Phyllanthus amarus* and *Tamarindus indica* and their synergistic effect determination with antibiotics on multidrug-resistant bacterial pathogens

Bachelor of Science in Microbiology

Jahangirnagar University (JU), Bangladesh

Relevant coursework: General Microbiology, Fundamentals of Chemistry, Biostatistics, Biochemistry, Environmental Microbiology, Basic techniques in microbiology, Microbial Metabolism, Microbial Molecular Genetics, Enzymology, Microbial Biotechnology, Agriculture Microbiology

Research Experiences

Research Associate, Friedrich-Schiller University Jena

August 2023 – present

Advisor: Dr. Martina Herrmann, Aquatic Geomicrobiology, FSU.

- ✓ Project summary: The purpose of my project is twofold: (1) understanding the coupling between anammox and DNRA in oligotrophic groundwater (2) determining potential collaboration and spatial interactions between the respective microbial groups in the Hainich aquifer system.

Research Assistant, Max Planck Institute for Biogeochemistry, Jena

Group leader: Dr. Marion Schrumpf, Department of Soil Biogeochemistry

August 2022 – August 2023

- ✓ Determination of microbial biomass,
- ✓ Sample incubation and CO₂ measurement
- ✓ Soil extraction and analysis
- ✓ Literature review

Research Intern, Friedrich-Schiller University Jena

Advisor: Dr. Markus Lakemeyer, Institute of Organic Chemistry and Macromolecular Chemistry, FSU Sep 2022– Oct 2022

- ✓ Worked on the project: Recombinant membrane protein production in *Escherichia coli*
- ✓ Designed several fusion proteins (signal peptides from *E. coli* and gene of interest from *B. fragilis*)
- ✓ Synthesized a non-native membrane protein in *E. coli*
- ✓ Purified the protein using AKTA FPLC - chromatography system

Graduate Research Student, Institute of Microbiology, FSU

Advisor: Prof. Dr. Kai Papenfort, Chair of General Microbiology

January 2021 – May 2022

- ✓ Completed a research project to culminate in a master's thesis
- ✓ Project summary: The purpose of my project was twofold: (1) identifying novel small protein candidates in *V. cholerae* utilizing ribosome profiling data and performing validation of those candidates (2) determining interaction partners of the validated small proteins utilizing co-immunoprecipitation and mass spectrometry.

Graduate Research Student, Jahangirnagar University

Advisor: Prof. Dr. Md. Anwar Khasru Parvez, Department of Microbiology

January 2015 – May 2017

- ✓ Completed several research projects including a master's thesis project
- ✓ Thesis project summary: The purpose of my project was to assess the antimicrobial and synergistic effects of two medicinal plant extracts with antibiotics against multidrug-resistant pathogenic *E. coli* and *S. aureus*.
- ✓ Mentored two newly joined master's thesis students
- ✓ As a senior graduate student in the lab, I performed equipment inspections, ordered research materials and optimized lab protocols.

Skills and Techniques

- ✓ Preparation of pure culture, stock and competent cells, Growth curve analysis, Biochemical and physiological assays, Microscopy.
- ✓ Nucleic acid extraction, PCR, qPCR, Gel electrophoresis, Mutagenesis, Cloning, Gene knockout & overexpression.
- ✓ Recombinant protein designing, Protein expression, SDA-PAGE, Western blotting, Coomassie blue and silver staining, Co-IP, Chromatography, AKTA FPLC, Mass spectroscopy, Enzyme activity analysis.
- ✓ Isotope based rate measurement assays, Fluorescence microscopy (FISH/CARD-FISH/DOPE-FISH)
- ✓ R programming, Amplicon sequencing and MiSeq data analysis, Metagenomic analyses.
- ✓ BLAST, Alignment, Gene homology analysis, Protein domain and structure analysis.
- ✓ MS Office suite (advanced), ImageJ, Chimera, Cytoscape, Benchling, UGENE, Adobe Photoshop.

Teaching Experiences

- ✓ Supervised and evaluated student's laboratory work "Microbial physiology" at Friedrich-Schiller University

Professional Courses

- ✓ Industrial Biotechnology (Grade: 95.71%) (Coursera)
- ✓ Literature and Data analysis (The "Integra" Funding Program - DAAD 2020)
- ✓ Presentation of scientific data (The "Integra" Funding Program - DAAD 2020)

Publications

1. **Rahman, M.A.**, Heme, U.H. and Parvez, M.A.K., 2022. In silico functional annotation of hypothetical proteins from the *Bacillus paralicheniformis* strain Bac84 reveals proteins with biotechnological potentials and adaptational functions to extreme environments. Plos one, 17(10).
2. Ferdous, R.N., **Rahman, M.A.**, Hussain, M.A., Akhter, N., Banik, P.C. and Rahman, M.M., 2022. Prevalence of imipenem resistant gram-negative bacteria in a tertiary care hospital of Dhaka, Bangladesh. Bangladesh Journal of Medical Science, 21(1), pp.145-150.
3. Parvez, M.A.K., Saha, K., Rahman, J., Munmun, R.A., **Rahman, M.A.**, Dey, S.K., Rahman, M.S., Islam, S. and Shariare, M.H., 2019. Antibacterial activities of green tea crude extracts and synergistic effects of epigallocatechingallate (EGCG) with gentamicin against MDR pathogens. Heliyon, 5(7).
4. **Rahman, M.A.**, Marzan, M. and Parvez, M.A.K., 2018. Synergism of *Phyllanthus niruri* Extract with Gentamicin against Methicillin Resistant *Staphylococcus aureus*. European J Med Plants.
5. Parvez, A.K., Jubyda, F.T., Ayaz, M., Sarker, A., Haque, N., Khan, M.S., Mou, T.J., **Rahman, M.A.** and Huq, M.A., 2024. Microbial-and Plant-Derived Bioactive Peptides and Their Applications against Foodborne Pathogens: Current Status and Future Prospects. International Journal of Microbiology, 2024(1), p.9978033.

Conference Presentations

1. Potential coupling between nitrogen transformation processes in oligotrophic groundwater (2024). VAAM_2024.
2. Small proteins in *Vibrio cholerae* (2022). Poster Presentation at the Bacterial Networks (BacNet22), EMBO, 2022.
3. Synergism of natural bioactive compounds with gentamicin against methicillin-resistant *Staphylococcus aureus* (2017). Poster Presentation at the International Conference on Genomic, Nanotech, and Bioengineering.
4. *Lactobacillus sp.* in yogurt samples of Bangladesh and their potential to produce antimicrobial compounds (2017). Poster Presentation at the 30th Bangladesh Society of Microbiologists (BSM) Conference, Dhaka University.