

Sayed Huzaifa Mumit



Chittagong, Bangladesh

Education

University of Science and Technology Chittagong (USTC), Bangladesh *Class of 2028*

B.S. (Hons.) in Biochemistry and Biotechnology

Academic Mail ✉ Minors: Biophysical Chemistry, Biostatistics, Pharmaceutical Chemistry, Spectroscopy

Research Interests

RNA biology, genomics, and CRISPR-based approaches; immunology and computational biology; phytochemistry and network pharmacology; environmental sustainability and renewable energy.

Research Experience

Undergraduate Researcher, Bangladesh Bioscience Research Group (BBRG) *Oct 2024 – Present*

Supervisor: Dr. Md. Monirul Islam

- Conducted research on RNA biology, genomics, and CRISPR-based genome editing approaches.
- Investigated immunology through computational biology methods.

Peer-Reviewed Publications

- Dey, E., Dey, S., Nandi, L., Mumit, S.H., Arfat, R., Saif, S.R., Islam, M.M. (2026). *In silico Characterization of Bioactive Phytochemicals as Antivirals Targeting the Reovirus 1 Protein for Inhibiting 1-Mediated Host Cell Entry. PLOS ONE*. DOI: 10.1371/journal.pone.0350009
- Sikder, A., Mumit, S.H. (2024). *Investigation of the Effectiveness of Using Luffa cylindrica to Reduce Water Consumption in Agriculture. Trends in Ecological and Indoor Environmental Engineering*, 2(4), 18–27. DOI: 10.62622/TEIEE.024.2.4.18-27

Preprints

- Mumit, S.H., Rafin, M.D., Ohe, A.G., Arpita, N. (2024, v1; 2025, v2). *Innovating Eco-Friendly and Sustainable Diapers and Pads from Water Hyacinth and Coconut Coir*. DOI: 10.21203/rs.3.rs-5453339/v2
- Mumit, S.H., Muhit, S.I. (2023, v1; 2025, v2). *Methane Production via Sabatier Reaction Using Hydrogen from Rainwater Electrolysis and Captured Carbon Dioxide*. DOI: 10.33774/coe-2025-lk4r7
- Mumit, S.H., Sikder, A. (2024). *Eco-Friendly and Cost-Effective Water Purification for Highly Polluted and Saline Sources Using Solar-Powered Distillation and Activated Carbon*. Working Paper, Cambridge Open Engage. DOI: 10.33774/coe-2024-ztkpb

Research Projects

1. *In Silico Computational Analysis of Colocasia Genus Plants* *2025*

Status: Ongoing Role: Researcher

Objective. Characterize bioactive phytochemicals of *Colocasia* species and evaluate their pharmacological potential through network pharmacology.

Methods.

- Phytochemical profiling
- Molecular docking (AutoDock)
- Pharmacokinetic screening (SwissADME)

Outcome. Analysis in progress; results are being compiled for future dissemination.

2. *In Silico Computational Analysis of Samanea Genus Plants* *2025*

Status: Ongoing Role: Researcher

Objective. Characterize bioactive phytochemicals of *Samanea* species and evaluate their pharmacological potential through network pharmacology.

Methods.

- Phytochemical profiling
- Molecular docking (AutoDock)
- Pharmacokinetic screening (SwissADME)

Outcome. Analysis in progress; results are being compiled for future dissemination.

3. *In Silico* Computational Analysis of *Abelmoschus* Genus Plants

2024 – 2025

Status: Ongoing *Role:* Researcher

Objective. Characterize bioactive phytochemicals of *Abelmoschus* species and evaluate their pharmacological potential through network pharmacology.

Methods.

- Phytochemical profiling
- Molecular docking (AutoDock)
- Pharmacokinetic screening (SwissADME)

Outcome. Analysis in progress; results are being compiled for future dissemination.

4. Luffa-Based Depth Filtration for Microplastic Removal Under Controlled Hydraulic Pressure

2024

Status: Completed *Role:* Researcher

Objective. Develop and evaluate a *Luffa cylindrica* (sponge gourd)-based depth filtration system for microplastic removal from water.

Methods.

- Design of a depth filtration prototype
- Testing under controlled hydraulic pressure conditions

Outcome. Presented at the Xylem Global Water Challenge 2024 (Stockholm, Sweden); recognized as a Finalist and People's Choice award winner at the Xylem Global Innovation Challenge 2024.

5. Buoyancy and Thermal Convection in Flame Orientation Under Gravitational Fields

2019 – 2020

Status: Completed (independent study) *Role:* Independent Researcher

Objective. Investigate the role of buoyancy-driven thermal convection in determining flame orientation under varying gravitational conditions.

Methods.

- Empirical observation of flame behavior under controlled gravitational orientation

Outcome. Findings documented as an independent research project; not formally published.

6. Graviton and Anti-Graviton Charges in Space-Time Curvature and Gravitational Interaction

2019 – Present

Status: Ongoing *Role:* Independent Researcher

Objective. Examine hypothetical graviton/anti-graviton charge interactions and their implications for models of space-time curvature.

Methods.

- Theoretical analysis of hypothetical particle-charge interactions in curved space-time

Outcome. Ongoing independent theoretical investigation; not formally published.

7. Innovating Eco-Friendly and Sustainable Diapers and Pads from Water Hyacinth and Coconut Coir

2024 – 2025

Status: Preprint (v2, 2025) *Role:* Lead Researcher

Objective. Develop a sustainable, low-cost alternative to conventional diaper and sanitary pad materials using water hyacinth and coconut coir as absorbent biomass.

Methods.

- Material characterization of water hyacinth and coconut coir fiber
- Evaluation of absorbency and material performance

89 **Outcome.** Published as a preprint (v1: 2024, v2: 2025). DOI: 10.21203/rs.3.rs-5453339/v2

90 **8. Methane Production via Sabatier Reaction Using Hydrogen from Rainwater Electrolysis and Captured Carbon**
91 **Dioxide** 2023 – 2025
92 *Status:* Preprint (v2, 2025) *Role:* Lead Researcher

93 **Objective.** Design a route to methane production by coupling hydrogen generated from rainwater electrolysis with
94 captured carbon dioxide via the Sabatier reaction.

95 **Methods.**

96 • Hydrogen generation via rainwater electrolysis
97 • Carbon dioxide capture
98 • Sabatier reaction process design

99 **Outcome.** Published as a preprint (v1: 2023, v2: 2025). DOI: 10.33774/coe-2025-lk4r7

100 **9. Eco-Friendly and Cost-Effective Water Purification for Highly Polluted and Saline Sources Using Solar-Powered**
101 **Distillation and Activated Carbon** 2024
102 *Status:* Working Paper (Cambridge Open Engage) *Role:* Lead Researcher

103 **Objective.** Develop a low-cost, solar-powered water purification method combining distillation and activated carbon
104 filtration for highly polluted and saline water sources.

105 **Methods.**

106 • Solar-powered distillation design
107 • Activated carbon filtration

108 **Outcome.** Published as a working paper, Cambridge Open Engage (2024). DOI: 10.33774/coe-2024-ztkpb

109 **10. Arsenic Toxicity and Innate Immune Response — Review Paper** Jan 2026 – Present
110 *Status:* Ongoing (Review manuscript in preparation) *Role:* Lead Author

111 **Objective.** Review current literature on arsenic toxicity and its interaction with innate immune signaling pathways.
112 [Confirm exact scope — e.g. mechanism-focused vs. exposure-focused — before finalizing.]

113 **Methods.**

114 • Systematic literature review and synthesis

115 **Outcome.** Review in progress; manuscript not yet complete.

116 **11. In Vitro, In Silico and In Vivo Evaluation of Phytochemistry of Curcuma longa** Jan 2026 – Present
117 *Status:* Ongoing *Role:* Contributor

118 **Objective.** Evaluate the anti-inflammatory activity of *Curcuma longa* phytochemicals through combined *in vitro* and
119 *in vivo* approaches.

120 **Methods.**

121 • *In vitro* anti-inflammatory assay using bovine serum albumin (BSA) protein denaturation
122 • *In vivo* evaluation using a mouse model

123 **Outcome.** Study ongoing; results pending.

124 **Conference Presentations (Presenting Author)**

125 1. **RURS 1st International Students Conference** 2024
126 *Trends in Microbial Culture and Antibiotic Sensitivity in Pediatrics*

127 2. **Xylem Global Water Challenge**, Stockholm, Sweden 2024
128 *Using Sponge Gourd for Purifying Microplastics*

129 3. **Stockholm Junior Water Prize** 2023
130 *Methane Gas Production from Rainwater and CO₂*

131 4. **6th International Conference on Biotechnology in Health and Agriculture**, Global Network of Bangladeshi Biotech-
132 nologists 2025

135Academic Service

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 - **International Peer Reviewer**, *International Journal of Plant and Soil Science*2025
137Manuscript: *Optimizing Sponge Gourd Cultivation: Effects of Chemical Hybridizing Agents on Morphological Traits*
138*and Flower Development*
 - **Panelist**, The Cambridge Panel: Academic, Cambridge University PressOct 2025 – Present
 - **Wiki Scientist**, Wikimedia Foundation / Wikipedia2024 – Present
 - **OAo Venture Translator**, International Astronomical Union2024
 - **Academic Olympiad Trainer**, Deviation Scientific Society2023 – Present

143Awards and Honors

- 144
 - Top-Ranked, People’s Choice – Xylem Global Innovation Challenge2024
 - Finalist – Stockholm Junior Water Prize2023
 - Qualifier – International Astro-Olympiad, Beijing, China2022
 - Medalist – 16th National Bangladesh Astro-Olympiad2022
 - 2nd Runner-up – Extempore Speech, Regional Round (Chittagong), Bangladesh Islamic Foundation2018
 - 2nd Runner-up – Essay Competition, Regional Round (Chittagong), Bangladesh Islamic Foundation2018

150Grants and Scholarships

- 151
 - Academia Engineering Publication Grant2024
 - Trends in Ecological & Environmental Engineering Journal Grant2024
 - Aspire Leaders Program, Harvard University2024
 - Wiki Scientist Summer Program Scholarship, American Physical Society / Wikimedia Foundation2024
 - APS Diversity Forum Scholarship, American Physical Society2024
 - Oxbridge Scholars Program, University of Oxford & University of Cambridge2022 & 2023
 - AB Memorial Fellowship2022

158Professional Memberships

- 159
 - Member, Astrophysics Division, American Physical Society2024 – Present
 - Member, American Society for Microbiology2024 – 2025
 - Graduate Member, BYLC Graduate Network2021 – Present
 - Member, Singapore Global Network2025 – Present

163Research and Technical Skills

Programming	Python, R
Operating Systems	Linux/UNIX shell
Computational Biology & Bioinformatics	Molecular docking, network pharmacology, phytochemical profiling
Software	AutoDock Vina, SwissADME, Cytoscape
Research Methods	In silico pharmacokinetic screening, network-based target analysis
Scientific Writing	Manuscript preparation, peer review
Typesetting	L ^A T _E X

165Languages

English (Intermediate)		Bengali (Native)		Chittagonian (Native)		Arabic (Reading Proficiency)
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167References

Dr. Md. Monirul Islam Faculty Member, Biochemistry & Molecular Biology, NSTU Postdoc, Aichi Medical University, Japan shafinbiochemistry@gmail.com monirul.bmb@nstu.edu.bd	Dr. Jeffrey M. Keefer Adjunct Assistant Professor Project Management & IT Education, New York University, USA jk904@nyu.edu Advisor, Wikipedia; mentored during APS Wiki Scientist course
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