Argajit Sarkar

PhD Candidate, Molecular Biology & Bioinformatics

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🌐 *https://argajitsarkr.github.io*

SUMMARY

I am a **PhD Candidate** bridging microbial pathogenesis with Artificial Intelligence. My research involves applying **Deep Learning** and **Large Language Models** for Drug Discovery to combat **Priority Pathogens.** My current project is a data-driven workflow to repurpose drugs against multidrug-resistant pathogens, aiming to create a faster, more efficient pipeline for discovering therapeutics against high-priority pathogens.

Apart from that, I'm also an NEP Saarthi 2020 Ambassador appointed by UGC, conducting workshops and events, and promoting key policies and initiatives of the University Grants Commission (UGC) and Ministry of Education (Govt. of India) throughout the University.

EDUCATION

Doctor of Philosophy (PhD) in Molecular Biology & Bioinformatics   Nov, 2024 – Present

Tripura University, Agartala, Tripura, India

Course work: Completed

M.Sc in Molecular Biology & Bioinformatics   Nov, 2022 – July 2024

Tripura University, Agartala, Tripura, India

CGPA: 8.15/10

B.Sc in Human Physiology with Honours   Mar, 2019 – Sept 2022

Holy cross college, Agartala, Tripura, India

CGPA: 6.45/10

RESEARCH/REVIEW/BOOK CHAPTERS & PREPRINTS

- **Paul, S.,** Sarkar, A.**, Ghosh, M. et al.** Quercetin as an additive adjuvant enhances ciprofloxacin and tetracycline efficacy against Vibrio cholerae by disrupting membranes, inhibiting biofilms, and reducing virulence levels. 3 Biotech 16, 3 (2026). *https://doi.org/10.1007/s13205-025-04621-x*

- Sarkar, A.**, Bhattacharjee, S.** Biofilm-mediated bioremediation of xenobiotics and heavy metals: a comprehensive review of microbial ecology, molecular mechanisms, and emerging biotechnological applications. 3 Biotech 15, 78 (2025). *https://doi.org/10.1007/s13205-025-04252-2*

- **Barik, S., Goswami, S., Nanda, P. K., Sarkar, A., Saha, B.,** Sarkar, A.,**& Bhattacharjee, S. (2025).** TGF-beta plays dual roles in immunity and pathogenesis in leishmaniasis. Cytokine, 156865. *https://doi.org/10.1016/j.cyto.2025.156865*

- Sarkar, A., Ghosh, E., Bhattacharjee, S. (2025). Harnessing Generative Artificial Intelligence for Periodontitis Prediction: A Machine Learning Approach Integrating Systemic Health Indicators for Precision Oral Health in Resource-Limited Settings. SSRN Preprint. *https://dx.doi.org/10.2139/ssrn.5334047*

- **Mandal, R., Saha, S., &** Sarkar, A. (2025). Ghrelin as a potential therapeutic peptide in cancer prevention: A narrative review of molecular and cellular mechanisms. In Proceedings of the 10th International Conference on Recent Advances in Bioscience (pp. 49–64). *KSG College of Arts and Science.*

- *Sarkar, A., Ghosh, E., Bhattacharjee, S. (2026). Harnessing Generative Artificial Intelligence for Periodontitis Prediction: A Machine Learning Approach Integrating Systemic Health Indicators for Precision Oral Health in Resource-Limited Settings. Frontiers in Dental Medicine **(Under Revision)***

- *Sarkar, A., Bhattacharjee, B., Chackraborty, C., Bhattacharjee, S. (2026).* The Emerging Landscape of Agentic AI: Integrating multi-agent collaborative systems, large language models (LLMs), and deep learning for a paradigm shift in pharmaceutical efficiency. Briefing in Bioinformatics **(Submitted)**

PATENTS AND GRANTS

System And Method For Development, Characterization And Simulation Of The Epitope-Base Peptide Therapeutic Vaccine Against Colorectal Cancer Using Neoantigens (International Patent)
- **Date of Filing – 11/12/2025**

EXPERIENCE

- **Working as Project Technical Support – III at (Indian Council of Medical Research) ICMR Funded Project,** titled: *"Integrating Gut Microbiome, Hormonal Profiles, and Lifestyle Factors for AI-Driven Metabolic Risk Prediction in Adolescents from Tripura, Northeast India with Adipocyte Validation."*   **Feb, 2026 – Present**

- **Peer Reviewer at 3 Biotech Journal IF 2.9 (Springer Nature)** *"Serving as a peer reviewer evaluating original research articles on antimicrobial resistance and biofilm formation".*   **Feb, 2026 – Present**

- **Full-Time PhD Candidate at Molecular Biology and Bioinformatics Department:** *"My research involves applying Deep Learning and Large Language Models for Drug Discovery to combat Priority Pathogens".*   **Nov, 2024 – Present**

- **NEP Saarthi Ambassador** *"appointed by UGC, conducting workshops and events, and promoting key policies and initiatives of the University Grants Commission (UGC) and Ministry of Education (Govt. of India) throughout the University."*   **Jan, 2025 – Present**

- **Dissertation project titled** "Exploring the Combinatorial Antimicrobial and Anti-Virulence Potential of Quercetin with Antibiotics Against *Vibrio cholerae."*   **Jan, 2024 – June 2024**

SKILLS

AI & ML: LLM, Machine Learning, Generative AI, AI Ethics, Hugging Face, GitHub.

Lab: Cell culture techniques, PCR, Gel Electrophoresis, Antimicrobial, and Antibiofilm assays.

Data Science: MS Excel and Python.

Relevant Courses: Professional Data Analytics, Python for Data Analytics.

COFFERENCE, SEMINARS & AWARDS

- **Poster Presentation** at International Conference on Advances in Biotechnology, Bioprocessing, and Structural Biology (ICABSB-2025), 11TH – 14TH December 2025 at *IIT Roorkie, Uttrakhand, India* (View Certificate)

- **Poster Presentation** at India International Science Festival (IISF) 2025, 6TH – 9TH December 2025 at *Chandigarh, Haryana, India* (View Certificate)

- **Poster Presentation** at AICBio 2025 (Research Symposium on Artificial Intelligence and Computational Biology), 3RD – 5TH December 2025 at *Amrita Vishwa Vidyapeetham, Coimbatore, Tamil Nadu, India* (View Certificate)

- **Oral Presentation** at Research Catalyst Global Symposium (RCGS), September 2025 Online (View Certificate)

- **Oral Presentation** at the National Conference on Recent Trends in Biological Sciences in Northeastern India (NCRTBSNEI-2025), March 2025 at *Tripura University, Tripura, India* (View Certificate).

- **Participated** in the Science Beyond Borders (Global S&T) event, India International Science Festival (IISF), 2024, at *IIT Guwahati, Assam*. (View Certificate)

- **Santanu Kar Memorial Merit Award** (Holy Cross College), Agartala, Issued February 2021, *Awarded for academic excellence during the academic year 2019/2020. View Certificate (PDF)*

LICENSES & CERTIFICATIONS

Data Science & Analytics

Python for Data Science and AI (IBM), Issued May 2025
- Credential: IBM20250505-27-27jqee.pdf")

Data Analysis with ChatGPT (365 Data Science), Issued November 2024
- Credential ID: CC-FB6B33CB37

Understanding Data Visualization (DataCamp), Issued November 2024
- Credential ID: d860df08f4b1b2114d0072fc55ca03f3932b962a

AI & Machine Learning

AI Ethics (365 Data Science), Issued April 2025
- Credential ID: https://learn.365datascience.com/certificates/CC-2ED2BAD10C/

NPTEL+ Workshop: WEKA Machine Learning for Healthcare, NPTEL (IIT Madras), Issued February 2025
- Credential ID: NP25WS227620603284

Understanding Machine Learning (DataCamp), Issued November 2024
- Credential ID: 736828043119ec438e22a229c26f0ca64ebea1fd

ChatGPT and Generative AI (365 Data Science), Issued November 2024
- Credential ID: CC-3D92AF4DD9

Bioinformatics & Genomics

Genomic Data Science (Coursera), Issued April 2025
- (View Certificate (PDF) Credential: Coursera 0Q8CTG38Q19J)

Workshop on "Multi-Ligand Docking Training with Vina and PyRx!" (Research Boulevard), Issued October 2024
- Credential ID: RBT/MD/ADMET/14/10/24/0054 **Certificate (PDF)**

2-Day Hands-on workshop "Comparative Genomics: Evolutionary Genomics Application," (Kent State University in Collaboration with Tripura University), Issued May 2024 **Certificate (PDF)**

Other Relevant Certifications & Workshops

Other Relevant Certifications & Workshops (IIT KANPUR) 12-Week course: Wildlife Ecology
- NPTEL, Issued January 2024
- (View Certificate PDF)
- Relevant Skills: Ecology, Wildlife Biology

Affiliations

ASM Global Outreach-Student Member (American Society for Microbiology), Issued January 2025
- *Certificate (PDF)*

Global Outreach-Student Member (British Society of Immunology), Issued August 2025

AIRSA: All India Research Scholar Association, Member since October 2025