Bidisha Bhowal

I am an engineer with a specialization in Biotechnology. I hold an M. Tech in Industrial Biotechnology. I have over five years of research experience working in the field of molecular and cell biology, biochemistry, and bioinformatics. I have previously worked as a Project Associate I on a DBT-sponsored project at ICGEB, New Delhi, where I designed, planned, and executed experiments, contributed extensively to scientific data and report writing, and managed laboratory operations. I am currently awaiting my PhD defence.

Education

Master of Technology in Industrial Biotechnology (2015-2017)
Delhi Technological University……CGPA 9.05

Bachelor of Technology in Biotechnology (2011-2015)
Bengal College of Engineering and Technology, West Bengal University of Technology……CGPA 9.26

All India Senior School Certificate Examination (2009-2011)
Central Board of Secondary Education……86%

All India Secondary School Examination (2008-2009)
Central Board of Secondary Education……90.5%

Experience

Worked as a Project Associate I (JRF) at the International Centre for Genetic Engineering and Biotechnology, New Delhi in a DBT-sponsored project under the mentorship of Prof. S.K. Sopory, Emeritus Scientist, ICGEB from December 2017 to February 2021.
Key Responsibilities: including but not limited to designing and conducting experiments, RNA isolation, cDNA synthesis, quantitative real-time PCR, biochemical techniques, report writing, and manuscript writing. Published 2 research articles, 2 review articles, and 1 book chapter during this tenure

Skills

- **Technical skills:** Molecular techniques: DNA, RNA, plasmid isolation and extraction, PCR, Standardization and optimization of protein isolation, over-expression, purification, and characterization through western blotting, Biochemical characterization using enzyme activity assays, Abiotic stress assays, Transcriptome data analysis, miRNA identification, primer designing, and expression analysis using qRT-PCR techniques, Microbiological techniques like bacterial isolation, especially PGPRs (Plant growth promoting rhizobacteria) from different samples, plant-microbe interaction, bioformulation, identification using 16srRNA sequencing, chemotaxis assay, stress treatments and analysis using biochemical assays, Basics of tissue culture and microscopy.

- **Computational skills:** Bioinformatics including genome mining, gene identification, *in silico* analysis through publicly available online tools and packages, Molecular docking using open access tools, Molecular dynamic simulation using both GROMACS and Schrödinger's Molecular Modeling Suite, Basics of R and Python 3.0

- **Soft Skills:** Adaptability, problem-solving, troubleshooting, time management, collaboration, active listening, team player, keen attention to detail.

Awards and Recognition

- Qualified GATE(BT) 2015 with AIR 393 and GATE percentile 95.6%

- Qualified CSIR-Direct SRF 2021

Additional Experience

- Peer reviewed 3 research articles for PeerJ, Plant Gene, and the Journal of Applied Genetics (Springer Nature)

Training, Workshop, and Conferences

- Bhowal, B., Hasija, Y. & Singla-Pareek, S.L. Do glyoxalases contribute to the innate stress tolerance of wild rice? International Conference on Biochemical and Biotechnological Approaches for Crop Improvement (IBBACI 2023), NASC Complex, New Delhi. 2023
- Bhowal, B., Hasija, Y. & Singla-Pareek, S.L. A pan-genome survey of GLYI and GLYII proteins across wild and cultivated rice varieties provides crucial insights into their evolution and role in stress tolerance. Vistas in Life Sciences (2024): An International Conference on Frontiers of Life Sciences: From Molecules, Organisms & Diseases, School of Life Sciences, Jawaharlal Nehru University, New Delhi, India. 2024
- ÄKTA FPLC Training Workshop, ICGEB, New Delhi
- Cloud-based Hands-on Workshop: Rational Computational Drug Design Approaches jointly organized by Schrödinger and ICGEB, New Delhi.
- International Summit on Women in STEM–"Visualizing the Future: New Skylines jointly organized by DBT and ICGEB, New Delhi
- One-week online workshop on Intellectual Property Rights and Entrepreneurship Development (IPRED 2020) organized by NIT Silchar

Publications

- Bhowal, B., Hasija, Y., & Singla-Pareek, S. L. (2024). Tracing the intraspecies expansion of glyoxalase genes and their expanding roles across the genus Oryza. *Functional & integrative genomics*, *24*(6), 220. https://doi.org/10.1007/s10142-024-01492-y
- Garai, S., Bhowal, B*., Gupta, M., Sopory, S. K., Singla-Pareek, S. L., Pareek, A., & Kaur, C. (2024). Role of methylglyoxal and redox homeostasis in microbe-mediated stress mitigation in plants. Plant science : an international journal of experimental plant biology, 338, 111922. https://doi.org/10.1016/j.plantsci.2023.111922
- Chatterjee, Y., Bhowal, B., Gupta, K. J., Pareek, A., & Singla-Pareek, S. L. (2023). Lactate Dehydrogenase Superfamily in Rice and Arabidopsis: Understanding the Molecular Evolution and Structural Diversity. International journal of molecular sciences, 24(6), 5900. https://doi.org/10.3390/ijms24065900
- Gaba, Y., Bhowal, B., Pareek, A., & Singla-Pareek, S. L. (2023). Genomic Survey of Flavin Monooxygenases in Wild and Cultivated Rice Provides Insight into Evolution and Functional Diversities. International journal of molecular sciences, 24(4), 4190. https://doi.org/10.3390/ijms24044190
- Bhowal, B., Bhattacharjee, A., Goswami, K., Sanan-Mishra, N., Singla-Pareek, S. L., Kaur, C., & Sopory, S. (2021). Serotonin and Melatonin Biosynthesis in Plants: Genome-Wide Identification of the Genes and Their Expression Reveal a Conserved Role in Stress and Development. International journal of molecular sciences, 22(20), 11034. https://doi.org/10.3390/ijms222011034
- Garai, S., Bhowal, B*., Kaur, C., Singla-Pareek, S. L., & Sopory, S. K. (2021). What signals the glyoxalase pathway in plants?. Physiology and molecular biology of plants : an international journal of functional plant biology, 27(10), 2407–2420. https://doi.org/10.1007/s12298-021-00991-7
- Garai, S., Bhowal, B., Pareek, A. et al. Expression dynamics of glyoxalase genes under high temperature stress in plants. Plant Physiol. Rep. 25, 533–548 (2020). https://doi.org/10.1007/s40502-020-00545-1
- Bhowal, B., Singla-Pareek, S. L., Sopory, S. K., & Kaur, C. (2020). From methylglyoxal to pyruvate: a genome-wide study for the identification of glyoxalases and D-lactate dehydrogenases in Sorghum bicolor. BMC genomics, 21(1), 145. https://doi.org/10.1186/s12864-020-6547-7
- Bhowal, B., Chandra, P., Saxena, S.C. (2021). Engineering Glycine Betaine Biosynthesis in Alleviating Abiotic Stress Effects in Plants. In: Wani, S.H., Gangola, M.P., Ramadoss, B.R. (eds) Compatible Solutes Engineering for Crop Plants Facing Climate Change. Springer, Cham. https://doi.org/10.1007/978-3-030-80674-3_4
- *Equal contribution

Freelancing

- Assessed state of the art LLMs based on their educational capabilities.

Contact Information

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