MONOLINA SARKAR

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FELLOWSHIPS

- CSIR- SRF January 2014 in Life Science
- CSIR-JRF, June 2011 in Life Science , All India RANK 42
- Qualified Graduate Aptitude Test in Engineering (GATE), January 2011 in Life Sciences (Chemistry, Biochemistry, Botany) All India Rank-608

EDUCATION

- PhD (Thesis Submitted), 2019

Thesis: Insights Into The Role Of Type III Secretion System In Nodulation Of *Arachis hypogaea*.
Laboratory of Professor Maitrayee DasGupta
Department of Biochemistry, University of Calcutta

- M.Sc-BOTANY, 2011

University of Calcutta, Grade: 73%
Summer Dissertation: Interaction of ZnO Nanoparticle with DNA in human lymphocyte and plant root meristematic cells
Review project: Evolution of sex chromosomes in plants
Laboratory of Professor Anita Mukherjee
Department of Botany, University of Calcutta

- B.Sc-BOTANY (HONORS), 2009

Lady Brabourne College, Kolkata Grade: 63.75%
Group research project: Studying the floral diversity of the Western Ghats

- HIGHER SECONDARY EXAMINATION, 2006

Patha Bhavan, West Bengal Council of Higher Secondary Education Grade: 73.1% Mathematics, Physics, Biology, English, Hindi

- SECONDARY EXAMINATION, 2004

Patha Bhavan,West Bengal Board of Secondary Education
Grade: 84.25% Mathematics, Physical & Life Science, Geography, History, English, Hindi, Additional Mathematics

RESEARCH EXPERIENCE

- Senior Research Fellow, 2014-2019
- Junior Research Fellow, 2012-2013

Department of Biochemistry, University of Calcutta
Mentor: Professor Maitrayee DasGupta

- Visiting Researcher, October 2015-December 2015

LSTM-JA-A-82/5 Campus International de Baillarguet, Montpellier
Mentor: Dr. Fabienne Cartieaux
Research interest: Endophytes enter the interior of plants at emerging lateral roots by crack entry without elucidating defense response. In spite of having ample evidence that endophytes can enhance plant growth and improve plant nutrition, the molecular basis of plant-endophytic interactions is not well understood. My research interests deal with this unknown aspect of plant-microbe interaction. My contributions have been to identify that in *Oryza/ Arachis* intercropped fields, endophytes of *Oryza* formed a distinct genotypic cluster as compared to the *Arachis* endosymbionts, though both have the same mode of "crack"-mediated colonization. The *Oryza* endophytes were also *nodABC*-deficient, unlike the *Arachis* endosymbionts which cause severe chlorosis in *Oryza* under controlled conditions. The study suggested that *Oryza* exerts a selection on the choice of the colonizing endophytes.

PUBLICATIONS

- Guha S, Sarkar M, Ganguly P, Uddin MR, Mandal S & DasGupta M (2016) Segregation of nod-containing and nod-deficient bradyrhizobia as endosymbionts of Arachis hypogaea and as endophytes of Oryza sativa in intercropped fields of Bengal Basin, India. Environmental microbiology. (https://doi.org/10.1111/1462-2920.13348)

SKILLS

- DNA Sequencing: Bacterial genomic/plasmid DNA extraction; Primer designing; PCR, DNA sequencing sample preparation (BigDye TerminatorV3.1), running sequencer (Applied Biosystems 3730xl DNA analyzer), data collection, analysis.
- *in silico* analysis: Sequence analysis (BLAST, Sequence Alignments, SMART, ExPASy, CLC Workbench tools), 16SrRNA gene ribotyping/MultiLocus Sequence Typing for microbial Identification, Phylogenetic analysis (MEGA6) · Microbiology: Media preparation, sterilization of inoculation and incubation zone as per general laboratory practice; Isolation of bacteria from plants; maintenance and sub culturing of strains; Measuring CFU, growth kinetics; characterising antibiotic sensitivity, thiosulafte utilisation, oligotrophism, symbiotic effectiveness in plants.
- Microscopy: Microtomy/Cryotomy of plant samples. Analysis using Stereo and Confocal microscopy.
- Statistical Analysis: Measures of dispersion and Tests of Hypothesis
- Microbiology: Enrichment technique to isolate soil Nitrogen-fixing bacteria Simple, negative, differential staining of bacteria; Microbial RAPD profiling, preliminary NGS data analysis using GENEIOUS. · Genotoxicity Assays: Histopaque density gradient separation of Lymphocyte from human peripheral blood; in vitro and in vivo genotoxicity monitoring in Lymphocytes and plant cells (Comet/Chromosomal Aberration Assay)
- Molecular Biology: DNA Cloning (Restriction Enzyme, Gateway), RNA extraction; semi-quantitative and RT-PCR, RNAi plant generation (Agrobacterium-mediated transformation), Chromosomal staining, karyotype, mitotic index analysis; Over-expressed protein purification (column chromatography), protein estimation, SDS-PAGE.
- Computational Skills: Microsoft Office; Adobe Photoshop; managing bibliographies (EndNote Tool).

PRESENTATIONS

- 2017 Poster presentation on "Segregation of TTSS-containing and TTSS-deficient bradyrhizobia as endosymbionts of Arachis hypogaea and as endophytes of Oryza sativa in intercropped fields of Bengal Basin, India-a case of partner choice and host sanctions" at Emerging Trends in Biology, CAS-Phase II, Department of Biochemistry, University of Calcutta
- 2014 Abstract and poster on "Arachis and Oryza in an intercropped field are colonized by nod+ and nod divergent Bradyrhizobial populations respectively" International Symposium on Plant signaling & Behavior. Department of Botany, University of Delhi.
- 2014 Abstract and oral presentation on "Distinct Bradyrhizobial populations colonise Arachis and Rice in an intercropped field" Department of Biotechnology (Ministry of Science and Technology, Govt. Of India) and Calcutta University.

CONFERENCES,WORKSHOPS

- 2020: "Recent Biotechnological Tools for Crop Improvement", Advanced Post Graduate Centre, Acharya N.G. Ranga Agricultural University in Association with Institutional Development Plan (IDP) under NAHEP.
- 2015-Biotica-: An International Symposium on current perspectives in Life Sciences India
- 2013-National Workshop on Imaging, University of Calcutta
- 2012-International Conference on Legume Genetics and Genomics (ICLGG), Hyderabad
- 2012-Workshop-"Intellectual Property and Innovation Management in Knowledge Era". National Research Development Corporation, New Delhi and University of Calcutta

TEACHING EXPERIENCE

- STATE-AIDED COLLEGE TEACHER (CATEGORY-I),BOTANY DEPARTMENT

Sammilani Mahavidyalaya (University of Calcutta)- 01/2020 - Present

- GUEST LECTURER, BOTANY DEPARTMENT

Brahmananda Keshabhandra College (West Bengal State University); 08/2017-12/2019
Sammilani Mahavidyalaya (University of Calcutta)- 08/2018 - 12/2019

- RESOURCE PERSON (VISITING), BOTANY DEPARTMENT

Diamond Harbour Women's University; 02/2019 - 12/2019

- GUEST LECTURER, BIOTECHNOLOGY DEPARTMENT; 01/2017 - 07/2017

JIS University

SUBJECTS TAUGHT

Taught B.Sc and M.Sc levels in Cell Biology, Genetics, Plant Biotechnology, Molecular Biology, Plant Developmental Biology, Ecology, Phycology and Bryology

DUTIES INVOLVED

- Managed syllabi, schedules and logistics for students.
- Collaborated with colleagues to improve student progress and address their needs.
- Prepared lesson plans, handouts and conducted presentations based on curriculum.
- Conducted discussion sessions on the course.
- Supervised and evaluated students' examination work.