

Sanjay Singh, PhD

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Education

Doctor of Philosophy, Agricultural Biotechnology

Assam Agricultural University, Jorhat

Dissertation title: "Genome-wide identification, characterization and validation of microRNA associated with drought stress in local rice landraces of Assam"

Aug 2013 - Dec 2018

CGPA: 8.22

Master of Science, Biotechnology

Jiwaji University, Gwalior, India

Thesis title: "Genetic variability in the isolates of *Bipolaris maydis* causing maydis leaf blight of maize".

July 2010-June 2012

CGPA: 7.96

Bachelor of Science, Botany and Chemistry (with Zoology)

DDU, Gorakhpur University, India

July 2007-June 2010

CGPA: 5.96

Employment Highlights

Research Associate-III

ICAR-Indian Agricultural Statistics Research Institute, New Delhi

Project: "Mainstreaming rice landraces diversity in varietal development through genome wide association studies: A model for larger-scale utilization of gene bank collection of rice"

June 2022 – July 2025

Senior Project Associate

DBT- North East Centre for Agricultural Biotechnology (DBT-AAU Centre)

Assam Agricultural University, Jorhat, India

April 2020 – May 2022

Research Associate

CSIR- North East Institute of Science and Technology, Jorhat, India

Project: "Development of brown spot (*Drechslera oryzae*) disease tolerance in rice through multiplex-multigene CRISPR-Cas9/Cpf1 genome editing system"

Jan 2019 – Mar 2020

Junior Research Fellow

Assam Agricultural University, Jorhat, India

Project: "Biotechnological interventions through RNAi approach for Management of Banana Bunchy Top Virus (BBTV) in northeast region of India"

June 2018 - Jan 2019

Senior Research Fellow

ICAR Research Complex for NEH Region, Arunachal Pradesh Center, Basar

Project: "National Initiative on Climate Resilient Agriculture (NICRA)"

Dec 2012 – July 2013

Fellowships

- DBT-JRF (2013)
- CSIR-UGC-NET JRF (2013)
- ICAR NET (2013)
- ICAR-SRF with fellowship (2014, 2024)

Publications (# equal contribution)

- Meshram, S., Das, D., **Singh, S.**, Bhattacharjee, M., Patil, R. I., Arunima, S., ... & Acharjee, S. (2025). Dynamics of cytosolic and organellar gene transcripts in wild and cultivated genotypes of pigeon pea due to simulated herbivory. *Plant Science*, 112537.
- Gogoi, S., **Singh, S.**, *et al.*, (2024). Grain iron and zinc content is independent of anthocyanin accumulation in pigmented rice genotypes of Northeast region of India. *Scientific Reports*, 14(1), 4128.
- Joshi B, **Singh S.**, *et al.*, (2023). Genome-wide association study of fiber yield-related traits uncovers the novel genomic regions and candidate genes in Indian upland cotton (*Gossypium hirsutum* L.). *Frontiers in Plant Science*, 14, 1252746.
- **Singh, S.**[#], Sarki, Y. N.[#], Marwein, R.[#], *et al.*, (2023). Unraveling the role of effector proteins in *Bipolaris oryzae* infecting North East Indian rice cultivars through time-course transcriptomics analysis. *Fungal Biology*.
- Marwein, R.[#], **Singh, S.**[#], *et al.*, (2022). Transcriptome-wide analysis of North-East Indian rice cultivars in response to *Bipolaris oryzae* infection revealed the importance of early response to the pathogen in suppressing the disease progression. *Gene*, 146049.
- Saikia, B., **Singh, S.**, *et al.*, (2020). Multigene CRISPR/Cas9 genome editing of hybrid proline rich proteins (HyPRPs) for sustainable multi-stress tolerance in crops: the review of a promising approach. *Physiology and Molecular Biology of Plants*, 1-13.

- **Singh, S., Kumar, A., et al., (2020).** Identification and characterization of drought responsive miRNAs from a drought tolerant rice genotype of Assam. *Plant Gene*, 21, 100213.
- Devi, K.#, Dey, K. K.#, **Singh, S.#, et al., (2019).** Identification and validation of plant miRNA from NGS data—an experimental approach. *Briefings in functional genomics*, 18(1), 13-22.
- Gogoi, R., **Singh, S., et al., (2014).** Genetic variability in the isolates of *Bipolaris maydis* causing maydis leaf blight of maize. *Afr. J. Agric. Res*, 9, 1906-1913.
- Joshi B, **Singh S, et al.,(2026).** Tools and Techniques Used for Quantitative Trait Loci (QTL) and Association Mapping Studies. In *GWAS and QTL Mapping in Horticultural Crops: Vegetable Crops* (pp. 61-113). Singapore: Springer Nature Singapore.
- Sarki YN, Marwein R, **Singh S, et al., (2020).** Understanding the mechanism of host-pathogen interaction in rice through genomics approaches. *Rice Research for Quality Improvement: Genomics and Genetic Engineering*, Springer, Singapore

Selected Laboratory Skills and Technique

Molecular Biology and Biochemistry

- RNA and DNA isolation, PCR, qPCR, RT-PCR
- Plasmid Isolation and generation of construct for cloning in *E. coli*
- Genotyping using SSR and RAPD markers
- sgRNA design using Benchling and CRISPR-Cas9/Cpf1 construct design
- Protein isolation, ELISA, Spectrometric enzyme and osmolyte assay

Bioinformatics

- Proficient in Linux and HPC
- R programming
- NGS data analysis, variant calling from GBS and WGS data, GWAS analysis
- ncRNA, mRNA gene expression and co-expression analysis
- Phenotypic data analysis and core germplasm selection
- SSR mining, Virtual cloning

Plant Physiology

- Disease treatment and identification of disease stress symptom
- Abiotic stress treatment and phenotypic analysis

Microbial and Plant pathology

- Isolation of microorganisms
- Culture and preservation of microorganisms
- Microbial disease expression in plants

Employment Highlights

- One-week training on RNAseq analysis in Agrigenome Labs Pvt. Ltd., Kochi, December 2019
- Three days training on know-how of *indica* rice tissue culture in IIT, Guwahati, July 2019
- Two-week training on RNAi construct Design under Dr. R. Selvarajan, Principal Scientist (Virology), ICAR-National Research Centre for Banana, Tiruchirapalli, January 2019
- Workshop on Stem Cell Biology, organized by Dr Sanjeev K Waghmare, Principal Investigator, ACTREC and team members of Waghmare Lab, Mumbai, 2017
- Workshop on Proteomics, organized by BIF, IASST, Guwahati, 2016
- Workshop on NGS data analysis, organized in Department of Agricultural Biotechnology, AAU, Jorhat, 2016
- Capacity building in grant writing skill and effective management of IPR in Biotechnology by Universities and research institutions in NE-region, organized in Dibrugarh University, Dibrugarh, 2016
- Bioinformatics for gene discovery, organized under DBT-AAU centre for Agricultural Biotechnology, AAU, Jorhat, 2015
- Completed 5 of 8 Google Data Analytics Professional Certificate offered by Google through Coursera

Teaching and Training Experience

- **Instructor**, One-Day Hands-on Session: NGS file format and software installation
 - ICMR - National Institute of Cancer Prevention and Research (ICMR-NICPR) Department of Health Research (DHR), Ministry of Health & Family Welfare, Government of India
 - **Training Program:** Advent of Omics Technologies in Precision Diagnostics and Targeted Therapeutics
 - **Location:** ICMR-NICPR, Noida
 - **Duration:** April 15 - May 7, 2024
 - **Responsibilities:** Delivered expert lectures and hands-on training sessions on NGS file format, data pre-processing and software installation
- **Instructor**, Two-Day Hands-on Session: *Variant Analysis from Omics Datasets and RNA-Seq Data Analysis*
 - Part of the training program on “Applications of Bioinformatics in Life Science Research”
 - Organized by the School of Life Sciences, Jawaharlal Nehru University
 - Sponsored by the DBT Winter Research Workshop (March 11-21, 2024)
 - Topics covered: Variant identification, differentially expressed gene identification, gene network construction