Sanjay Singh, PhD
ICAR-Indian Agricultural Statistics Research Institute, New Delhi-110012
+91-7905127406 snjsngh800@gmail.com

Education

Doctor of Philosophy, Agricultural Biotechnology Aug 2013 - Dec 2018
Assam Agricultural University, Jorhat CGPA: 8.22
Dissertation title: "Genome-wide identification, characterization and validation of microRNA associated with drought stress in local rice landraces of Assam"

Master of Science, Biotechnology July 2010-June 2012
Jiwaji University, Gwalior, India CGPA: 7.96
Thesis title: "Genetic variability in the isolates of *Bipolaris maydis* causing maydis leaf blight of maize".

Bachelor of Science, Botany and Chemistry (with Zoology) July 2007-June 2010
DDU, Gorakhpur University, India CGPA: 5.96

Employment Highlights

Research Associate-III June 2022 – Present
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"

Senior Project Associate April 2020 – May 2022
DBT- North East Centre for Agricultural Biotechnology (DBT-AAU Centre)
Assam Agricultural University, Jorhat, India

Research Associate Jan 2019 – Mar 2020
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"

Junior Research Fellow June 2018 - Jan 2019
Assam Agricultural University, Jorhat, India
Project: "Biotechnological interventions through RNAi approach for Management of Banana Bunchy Top Virus (BBTV) in northeast region of India"

Senior Research Fellow Dec 2012 – July 2013
ICAR Research Complex for NEH Region, Arunachal Pradesh Center, Basar
Project: "National Initiative on Climate Resilient Agriculture (NICRA)"

Fellowships

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

Publications (# equal contribution)

- 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.
- 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
- CoreDECAP: Streamlined Extraction and Comparative Analysis of Core Samples **(Manuscript preparation)**

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

Workshops and Training

- 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

Current Work

- Transcriptome data analysis of cucumber in drought and heat stress from susceptible and tolerant variety
- Analysis of phenotypic (of augmented design) and genotypic (35k chip) data wheat that will lead to identification of loci associated with spot blotch, stem rust and drought
- Allelic fingerprinting of significant loci for favourable allele
- Analysis of whole genome resequencing data of cucumber and muskmelon: SNV/SV calling, GWAS analysis