Sanjay Singh, PhD
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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

Senior Project Associate (Bioinformatics) — April 2020 – Present
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)"

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

- NGS data analysis using Bash and R specialised in transcriptome data
- Proficient in use of Linux and R command line packages
- SQL query in BigQuery
- Gene co-expression analysis and visualization
- Virtual cloning using Vector NTI and SnapGene

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

Fellowships

- DBT-JRF 2013
- CSIR-UGC-NET JRF (Rank-61) 2013
- Indian Council of Agricultural Research (ICAR) NET, 2013
- ICAR-SRF with fellowship 2014

Publications (# equal contribution)

- Marwein, R.[#], **Singh, S**[#]., Maharana, J., Kumar, S., Arunkumar, K. P., Velmurugan, N., & Chikkaputtaiah, C. (2021). 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**., Debbarma, J., Velmurugan, N., Dekaboruah, H., Arunkumar, K. P., & Chikkaputtaiah, C. (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., Panda, D., Modi, M. K., & Sen, P. (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.[#],** Mishra, S. K., Modi, M. K., & Sen, P. (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.,** Singh, P. K., Kulanthaivel, S., & Rai, S. N. (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,** Dekaboruah HP, Singha DL & Chikkaputtaiah C. (2020). Understanding the mechanism of host-pathogen interaction in rice through genomics approaches. *Rice Research for Quality Improvement: Genomics and Genetic Engineering*, Springer, Singapore (In Press)
- **Singh, S[#].,** Marwein, R[#] & Chikkaputtaiah, C. (2022). Genome wide transcriptome analysis of *Bipolaris oryzae* revealed differential regulation of fungal gene at late stages of infection as primary cause of susceptibility in Rice (Manuscript in final stage).

Workshops and Training

- Completed 5 of 8 Google Data Analytics Professional Certificate offered by Google through Coursera (will complete the programme in mid-May 2022)
- 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