

Name :- Dr. Sanjana Negi

Designation :- DST INSPIRE Faculty

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PhD (2018)

Ph.D. in Life Sciences (Biotechnology). Thesis title “**Molecular studies on NAC transcription factors regulating secondary wall deposition and abiotic stress responses in banana**”. Work carried out at Homi Bhabha National Institute, Bhabha Atomic Research Center, Mumbai Maharashtra 400085

Awards and other recognitions received

1	IIT Bombay internal PDF	IIT Bombay	2018
2	DST- INSPIRE Faculty fellowship	DST	2018
3	DAE-Outstanding doctoral student award	HBNI	2019

Field of Specialization:- Plant Genetic Engineering, Molecular Biology and Bio-Technology

Research Experience: **8 years**

The research work carried out by Dr. Sanjana Negi has focused on understanding the transcriptional regulation of xylem development, secondary wall deposition and abiotic-stress responses in plants using banana (*Musa spp.*) as a model system. Toward her goals, she has primarily researched the roles of NAC-transcription factors in these aspects utilizing a combination of different molecular techniques and analysis of transgenic banana plants.

Current research work being pursued:- Can be summarized as given below

1. Investigating the impact of modulating secondary cell wall thickness on biotic stress responses
2. Understanding the effect of elicitor proteins in banana plants towards *Fusarium oxysporum* infection.
3. Analyzing the tissue specific and stress-inducible activity of promoter region of putative stress related transcription factors

Field of interest

1. Molecular biology
2. Cell & Tissue Culture
3. Genetic engineering of plants
4. Characterization of regulatory elements
5. Protein purification and characterization

Subjects taught:

Plant genetic engineering, Genomic and proteomics, Microscopy, Molecular Markers, Stress biology of plants

Research articles (published)

1. **Negi S**, Tak H, Ganapathi TR (2018) A banana NAC transcription factor (*MusaSNAC1*) impart drought tolerance by modulating stomatal closure and H₂O₂ content. *Plant Molecular Biology* doi: 10.1007/s11103-018-0710-4
2. **Negi S**, Tak H, Ganapathi TR (2018) “Xylem specific activation of 5' upstream regulatory region of two NAC transcription factors (*MusaVND6* and *MusaVND7*) in banana is regulated by SNBE-like sites”. *PLOS ONE* 13(2): e0192852
3. **Negi S**, Tak H, Ganapathi TR (2017) Native vascular related NAC transcription factors are efficient regulator of multiple classes of secondary wall associated genes in banana. *Plant Science* 265: 70-86
4. **Negi S**, Tak H, Ganapathi TR (2015) *In vitro* xylem vessel elements formation from banana embryogenic cells and expression analysis of vessel development-related genes, *Plant Biotechnol Rep.* 9: 47–54.
5. **Negi S**, Tak H, Ganapathi TR (2016) Functional characterization of secondary wall deposition regulating transcription factors *MusaVND2* and *MusaVND3* in transgenic banana plants, *Protoplasma* 253: 431-46.
6. **Negi S**, Tak H, Ganapathi TR (2015) Cloning and functional characterization of *MusaVND1* using transgenic banana plants. *Transgenic Res.* 24: 571-85.
7. **Negi S**, Tak H, Ganapathi TR (2015) Expression analysis of *MusaNAC68* transcription factor and its functional analysis by overexpression in transgenic banana plants. *Plant Cell Tiss Organ Cult.* 125: 59–70.

8. Tak H, **Negi S**, Ganapathi TR (2017) Overexpression of MusaMYB31, a R2R3 type MYB transcription factor gene indicate its role as a negative regulator of lignin biosynthesis in banana. PLoS One. 12:e0172695. (**equal contribution with first author**)
9. Tak H, **Negi S**, Ganapathi TR (2017) Banana NAC transcription factor *MusaNAC042* is positively associated with drought and salinity tolerance. *Protoplasma*. 254: 803-816.
10. Tak H, **Negi S**, Alka Gupta, Ganapathi TR (2018) " A stress associated NAC transcription factor MpSNAC67 from banana (*Musa x paradisiaca*) is involved in regulation of chlorophyll catabolic pathway. *Plant Physiol Biochem*. 132:61-71.(**equal contribution with first author**)
11. **Negi S**, Tak H, Ganapathi TR (2019) Overexpression of *MusaNAC68* reduces secondary wall thickness of xylem tissue in banana. *Plant Biotechnology Reports* 13: 151–160
12. Tak H, **Negi S**, Rajpurohit YS, Misra HS, Ganapathi TR (2020) MusaMPK5, a mitogen activated protein kinase is involved in regulation of cold tolerance in banana. *Plant Physiology and Biochemistry*. 146:112–123.

Book chapter

Tak H, **Negi S**, Bapat VA, Ganapathi TR (2016) Molecular Farming: Prospects and Limitation;; In *Banana: Genomics and Transgenic Approaches for Genetic*, Springer

Conference/Symposium presentations

1. **Sanjana Negi**, Himanshu Tak, T R Ganapathi (2018) *VND1-VND3* encodes xylem specific transcription factors and regulates multiple classes of secondary wall associated genes in banana. In: DAE-BRNS LIFE SCIENCES SYMPOSIUM 2018. Bhabha Atomic Research Centre, Mumbai, India, 26-28 April, 2018. Pp56. (**Best Poster Award**)
2. **Sanjana Negi**, Himanshu Tak, T R Ganapathi 2016. *MusaNAC68* transcription factor positively regulates salinity and drought tolerance in banana. In: 37th annual meeting of Plant tissue Culture Association (PTCA-India) & National Symposium on Plant Biotechnology for Crop Improvement. CSIR-National Botanical Research Institute, Lucknow, India, 25-27 February, 2016. Pp46.
3. **Negi S**, Tak H, Ganapathi TR (2015) Cloning and sequence analysis of banana *VND1* transcription factor and its overexpression in transgenic banana plants. NCRISSET-PUNE. NC-RISETPUNE-07065-800

4. Tak H, **Negi S**, Ganapathi TR (2016) *MusaNAC042*, a NAC transcription factor from banana confer elevated drought and salinity tolerance in transgenic banana; In: 37th annual meeting of Plant tissue Culture Association (PTCA-India) & National Symposium on Plant Biotechnology for Crop Improvement. CSIR-National Botanical Research Institute, Lucknow, India, 25-27 February, 2016. Pp43.
5. Himanshu Tak, **Sanjana Negi**, T.R Ganapathi (2018) Mitogen activated protein kinase 5 (MPK5) positively regulate cold stress tolerance in banana. In: DAE-BRNS LIFE SCIENCES SYMPOSIUM 2018. Bhabha Atomic Research Centre, Mumbai, India, 26-28 April, 2018. Pp55.