

Title: Molecular insights into plant cell proliferation disturbance by Agrobacterium protein 6b

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Description:

Agrobacterium transfers a segment of its plasmid DNA (T-DNA) into the host genome, which results in anatomical and morphological changes in infected plants, and in production of metabolites used by the infecting bacteria as a carbon and nitrogen source. Despite numerous studies in the last several decades, the specific roles of several T-DNA-encoded proteins in tumor induction remain obscure.

Objects:

Amongst the T-DNA encoded proteins, 6b appears to play a role in the expression of plant genes related to cell proliferation and the modification of the morphology of crown galls. The 6b genes have remarkable and unique effects on plant growth by inducing tumors on intact stems in a limited number of plant species.

Deliverables and Achievements to-date:

Our comprehensive structural, biochemical and genetic analysis pioneered by two graduate students in my lab paper demonstrates that 6b protein interferes with the host miRNA pathways by mediating ADP ribosylation of miRNA processing and slicing machineries and ultimately affecting gene regulation and cell growth alterations of the host plant.

Significance:

Our work provides molecular insights for the first time to reveal the molecular mechanism of biological consequences of Agrobacterium transferring a segment of its plasmid DNA (T-DNA) into the host genome.

Impact:

This paper has been selected as the cover feature for Jan. issue of Genes & Dev. and immediately selected and evaluated by Faculty of 1000, which places our work in F1000 library of the top 2% of published articles in biology and medicine.