

## Engineering disease resistant plants through RNA interference

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### Abstract

RNA interference (RNAi) is one of the several post-transcriptional gene-silencing strategies which suppress the expression of any specific gene. Essentially the double-stranded RNA-mediated RNAi process is extensively used as a knockdown tool to reveal the function of gene(s). In plants, primarily the transgenes producing hairpin RNA facilitate the RNAi process. RNAi technology is aimed to develop plant traits by manipulating the expression of endogenous genes and also to empower the plant to defend against invading pathogens by silencing specific gene(s) of the infecting agent. RNAi as a natural process can be exploited immensely to engineer plants, which are capable of defending themselves from biotic and abiotic stress without compromising the productivity. RNAi can showcase the path leading to integrated pest management technology and ultimately contribute to sustainable agricultural process. RNAi has been widely used to generate disease resistant plants and also to modulate the metabolic pathways which eventually lead to enhanced production of secondary metabolites having multifaceted benefits. RNAi strategy is considered to be advantageous over reverse genetics, co-suppression and antisense-mediated gene silencing, in terms of its stability and efficiency. Revealing the underlying molecular phenomena of RNAi would augment our ability to engineer disease resistant plants.

**Keywords:** RNA interference, gene-silencing, hairpin RNA, pest management, sustainable agriculture.