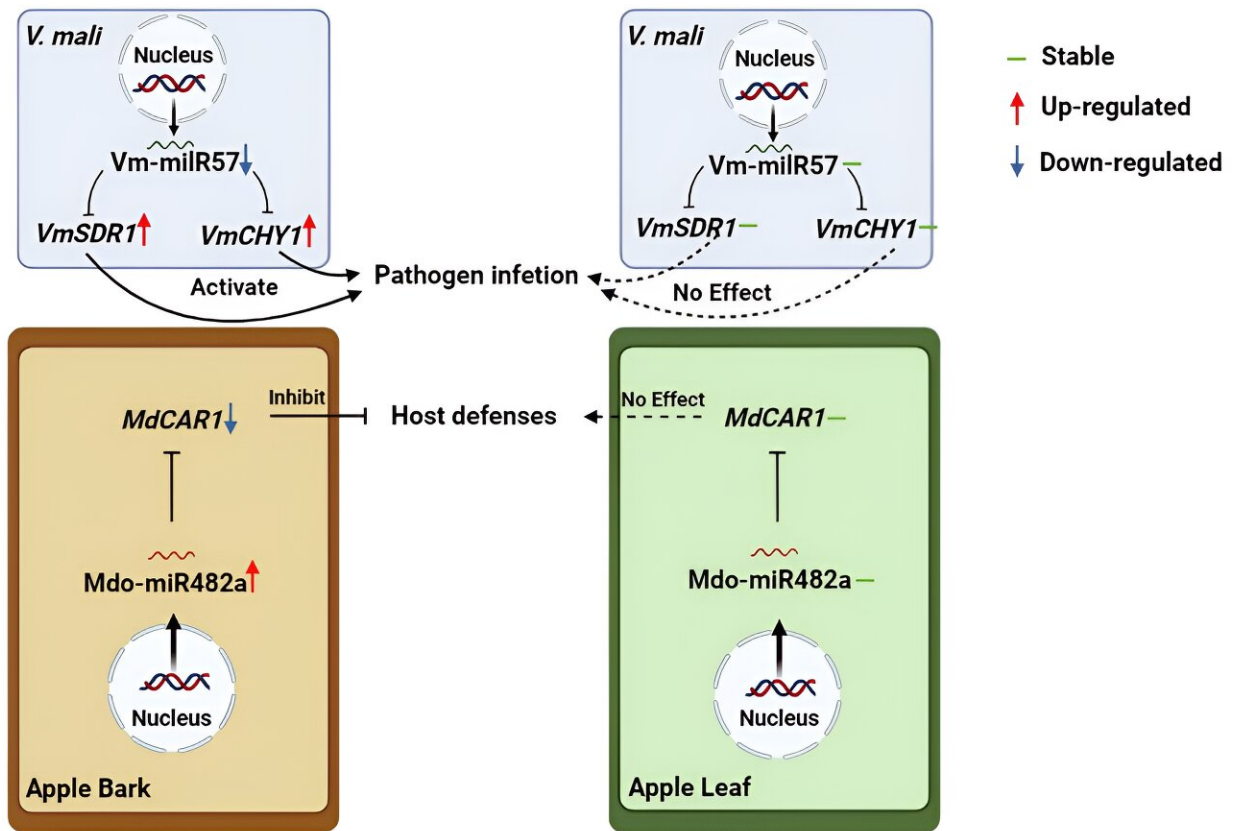


# Decoding disease defenses: miRNAs and the battle against apple pathogens

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Proposed model for the adaptive regulation of two key miRNAs/miRNAs in tissue-specific interaction between apple and *Valsa mali*. Credit: *Horticulture Research* (2024). DOI: 10.1093/hr/uhae094

Plant pathogens often infect specific tissues, causing significant

agricultural losses. Recent studies highlight the crucial role of small RNAs (sRNAs), including miRNAs, in regulating these interactions. sRNAs can modulate plant immune responses and pathogen virulence, making them key players in plant-pathogen dynamics.

Despite advances, the tissue-specific roles of miRNAs in these interactions remain largely unexplored. Due to these challenges, in-depth research on miRNA regulation during plant-pathogen interactions is essential to develop effective strategies for crop protection.

Researchers from Northwest A&F University have made significant strides in this area, with their findings, [published in \*Horticulture Research\*](#) on April 2, 2024. The study delves into the differential expression of miRNAs/milRNAs in apple tissues under attack by *Valsa mali*, offering insights into the plant's defense mechanisms.

This study uncovers the tissue-specific expression patterns of miRNAs and milRNAs in apple during *Valsa mali* infection. The researchers identified key miRNAs, such as Mdo-miR482a, which is upregulated in apple bark and targets an NLR gene, reducing the plant's resistance to the pathogen.

Similarly, Vm-milR57 in *V. mali* was found to target essential pathogenicity-related genes, enhancing the fungus's virulence. The study demonstrates that miRNAs in apple bark play a significant role in response to pathogen attack, while miRNA regulation in leaves appears minimal.

Additionally, the research highlights the cross-kingdom interaction where *V. mali* milRNAs can target [apple](#) genes, influencing the plant's defense mechanisms. These findings provide a deeper understanding of the complex regulatory networks involving miRNAs and milRNAs, emphasizing their critical roles in plant immunity and pathogen

adaptation.

**More information:** Chengyu Gao et al, Adaptive regulation of miRNAs/milRNAs in tissue-specific interaction between apple and Valsa mali, *Horticulture Research* (2024). [DOI: 10.1093/hr/uhae094](https://doi.org/10.1093/hr/uhae094)

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