

# Tomato stands firm in face of fungus

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Scientists at the University of Amsterdam have discovered how to keep one's tomatoes from wilting – the answer lies at the molecular level. The story of how the plant beat the pathogen, and what it means for combating other plant diseases, is published May 9th in the open-access journal *PLoS Pathogens*.

Farmers and fellow agriculturalists are continuously battling the ability of plant pathogens to co-evolve alongside their host's immune system. In agriculture, the most environmentally friendly way to combat the evolutionary change in plant diseases is to make use of the innate immune system of plants. Growers can cross into targeted plant varieties certain polymorphic resistance genes that occur in related plants, thereby naturally boosting the plant's immune system.

In this study, Dr. Martijn Rep and his team explored the molecular basis of this previously established concept of crossing in resistance genes. The authors considered the interaction between a fungal pathogen, *Fusarium oxysporum*, and the tomato plant in which the fungus causes *Fusarium* wilt disease.

The group found that a small protein secreted by some strains of the fungus causes it to overcome two of the tomato's disease resistance genes. However, a third resistance gene was shown to specifically target this suppressor protein, rendering the plant fully immune to any fungal strain that produces the protein. Thus, with the right set of resistance genes, tomatoes can beat the fungus despite the latter's "molecular tricks."

“This molecular analysis has revealed a hitherto unpredicted strategy for durable disease control based on resistance gene combinations,” say the authors.

Citation: Houterman PM, Cornelissen BJC, Rep M (2008) Suppression of Plant Resistance Gene-Based Immunity by a Fungal Effector. PLoS Pathog 4(5): e1000061. doi:10.1371/journal.ppat.1000061

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