CZECHGLOBE OPEN DISPUTATION

INVITATION

"Cytokinin mediated resistance and biocontrol"

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On **8th September 2014** at **14:30 pm** in the large meeting room

of **Global Change Research Centre AS CR, v. v. i.**; Brno, Bělidla 986/4a

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Abstract

Cytokinins are phytohormones that are known for long time to be involved in various regulatory processes of plant physiology and development, but have only recently been shown to modulate plant immunity. Complementary experimental approaches, including autoregulated cytokinin synthesis in response to pathogen infection, showed that cytokinins enhance resistance against the virulent hemibiotrophic pathogen *Pseudomonas syringae* in tobacco. The cytokinin-mediated resistance strongly correlated with an increased level of bactericidal activities and was shown to depend on the two major antimicrobial phytoalexins in tobacco, scopoletin and capsidiol. The specificity of the underlying mechanism is evident from a differential effect of the cis- and trans-isomers of zeatin. The integration into the complex plant defense network is evident from the involvement of salicylic acid and the negative interference of abscisic acid. The mechanism of cytokinin-triggered immunity was also shown to be the basis for the biocontrol activities of a *Pseudomonas fluorescence* strain that had been identified based on its growth promoting activity. Complementary gain- and loss-of-function approaches with the host plant and the biocontrol strain identified the microbial cytokinin production as a key determinant of the protection of the plant from a bacterial pathogen. The implications of this mechanism for the coevolution of host plants and cytokinin-producing agonists and pathogens and the possible practical application in agriculture to engineer pathogen resistance as well as abiotic and biotic cross tolerance are discussed.

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