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### 12<sup>th</sup> International Congress on

## **Microbial Interaction and Applications of Beneficial Microbes**

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# From genes to biocontrol: Unraveling the molecular mechanisms of mycoparasitic fungus-fungus interactions

Mycoparasitic species of the fungal genus *Trichoderma* are among the most successful bio-fungicides in today's agriculture although our understanding of the exact molecular mechanisms of their activity still is fragmentary. The biological control of fungal plant diseases by *Trichoderma* includes direct antagonism of phytopathogenic fungi by mycoparasitism. This mycoparasitic attack comprises sensing of the prey and chemotropic growth towards it followed by overgrowing and killing of the prey fungus. Genome sequence analysis of *Trichoderma* mycoparasites showed an abundance of cell wall lytic enzymes such as chitinases and glucanases essential for prey lysis and degradation and an assortment of genes involved in the formation of secondary metabolites for chemical warfare. The signals activating the mycoparasitic response include surface molecules and surface properties and may also include prey-derived secondary metabolites and other small substances exchanged between the interaction partners. Investigations of *Trichoderma atroviride* will be presented showing that this potent mycoparasite relies on G protein and MAP kinase signaling for triggering of the mycoparasitic response. Results on the role of the Gpr1 7-transmembrane receptor in the recognition of prey-derived signals will be shown as well as data on transcriptome profiling of gpr1-mutants and mutants interrupted in Tmk1 MAP kinase signaling.

#### **Biography**

Susanne Zeilinger has studied Microbiology and Genetics from the University of Vienna and during her Diploma thesis she gained experience in fungal enzyme characterization from the VTT Technical Research Center of Finland. She did her PhD from the Technical University of Vienna (TUW) on fungal cellulase gene regulation. As a Post-doctorate she has worked on *Trichoderma* biocontrol at TUW and as a Visiting Scientist at the Institute of Plant Pathology in Portici, Naples, Italy. In 2003, she became the Group Leader in the Research Area of Biotechnology and Microbiology at the Institute of Chemical Engineering at TUW. Since 2015, she is a Full Professor for Microbiology at the University of Innsbruck, Austria. Her research focuses on molecular fungal biology with a special interest in interactions of fungi with other (micro-) organisms, bio-communication and signal transduction.

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