

# **COS-OGA stimulates plant innate immunity in a cumulative process that involves salicylic acid**

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COS-OGA is a new patented active substance for plant protection registered in Europe against powdery mildew. COS-OGA contains chitosan oligomers (COS), plant non self-molecules combined with pectin-derived oligogalacturonides (OGA), plant self-molecules. COS-OGA mimics a plant-fungus interaction: during plant infection, fungal pathogens deacetylate their cell wall chitin into chitosan to escape plant chitin receptors. Chitosan fragmentation by plant enzymes then yields polycationic COS molecules while plant cell wall degradation by fungal polygalacturonases releases polyanionic OGA molecules. The plant defense stimulation was investigated on tomato plants after several foliar sprayings of COS-OGA. A proteomic study on leaves revealed that the elicitor treatment led mainly to an overexpression of Pathogenesis-Related proteins, among which subtilisin-like proteases. Gene expression study by qRT-PCR revealed that COS-OGA significantly upregulated transcripts of salicylic acid (SA)-responsive genes while transcripts linked to ethylene and jasmonic acid pathways were not affected. The activation of SA-dependent plant defense reactions was confirmed by SA quantification in the leaves. The results showed an increase of free SA levels in leaves, proportional to the number of COS-OGA applications. Finally, repetitive COS-OGA sprayings efficiently protected greenhouse-grown tomato against *Leveillula taurica*, with 90% leaf protection in terms of severity.