

**Title** Involvement of G-proteins in spore germination of *Penicillium digitatum* following exposure to citrus volatiles

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#### **Abstract**

Volatiles emitted from wounded peel tissue of various citrus cultivars had a pronounced stimulatory effect on germination and germ tube elongation of *Penicillium digitatum*, the cause of green mold decay of citrus fruit. The citrus volatiles identified in previous studies are esters, aldehydes, alcohols, ketones and hydrocarbons. The aim of the current study was to further understand the molecular mechanisms involved in promotion of conidial germination in the fungus *P. digitatum* in the presence of volatile compounds. The expression kinetics of the gene encodes 0- protein a-subunit was characterized in *P. digitatum* and *P. expansum* - a fungus that is non-pathogenic to citrus fruit. It was found that exposure of *P. digitatum* spores to limonene resulted in an increase in the expression levels of the gene encodes 0protein a-subunit. In contrast, exposure of *P. expansum* spores to limonene resulted in a decrease in the expression levels of this gene. Furthermore, the use of G-protein inhibitor or adenyl ate cyclase inhibitor together with exposing *P. digitatum* spores to limonene resulted in inhibition of spore germination. These results indicate that limonene is involved in the signal transduction pathway, in which G-protein and adenylate cyclase act as positive regulators of the early conidial germination in *P. digitatum*. This research had demonstrated that there is a specific recognition of the pathogen *P. digitatum* to the stimuli of volatile compounds from citrus fruit. Further research will be focused on examining mutants damaged in the genes found to be involved in early conidial germination in the fungus *P. digitatum*. This will help validate the proposed model system which includes the components of the signal transduction pathway leading to promotion of germination events in the cell.