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PECTIN INTEGRITY IN PLANT IMMUNITY

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The intensification of agricultural practices and climatic changes lead to an increased need for crop protection against pathogens. The identification of new plant genetic resources for resistance to pests becomes imperative to assure yields and food security. Fungi are the most important plant pathogens since they cause both yield reduction and food contamination by mycotoxins. Botrytis cinerea, the causal agent of grey mold disease, is a broad-spectrum fungal necrotrophic that causes serious pre- and post-harvest rot in more than 200 species worldwide, including important fruit crops. Cell Wall (CW) is the foremost interface at which interactions between plants and fungi take place. Pectin, one of the main components of CW, is methyl esterified in the Golgi and secreted in the CW in a high methyl esterified form. The activity of Pectin Methyl Esterase (PMEs) and methyl esterification status of pectin are critical for the outcome of plant-fungus interaction. The higher methyl esterification makes pectin less susceptible to the hydrolysis by microbial cell wall degrading enzymes and consequently, microbial growth is reduced. PME activity was associated to the production of de-methyl esterified and active oligogalacturonides, the best characterized Damage-Associated Molecular Patterns (DAMPs) in plants. Moreover, PME is responsible for the release of methanol, which may function as DAMP alerting adjacent non-infected tissues or neighboring plants. Despite this evidence, the current knowledge about the molecular mechanisms regulating pectin methyl esterification during disease remains largely unknown. Our findings point to pectin methylesterase inhibitors as protectors of cell wall integrity in plant immunity. The potential mechanisms of modification, perception and signal transduction of pectin methyl esterification during fungal infection will be discussed.

Biography

Vincenzo Lionetti is expertise in plant science field and he work as a professor at Sapienza University di Roma, Italy.

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