

The plasma membrane-associated Ca²⁺-binding protein PCaP1 is required for oligogalacturonide and flagellin-induced priming and immunity

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Abstract

Early signaling events in response to elicitation include reversible protein phosphorylation and re-localization of plasma membrane (PM) proteins. Oligogalacturonides (OGs) are a class of Damage-Associated Molecular Patterns (DAMPs) that act as endogenous signals to activate the plant immune response. Previous data on early phosphoproteome changes in *Arabidopsis thaliana* upon OG perception uncovered the immune-related phospho-regulation of several membrane proteins, among which PCaP1, a PM-anchored protein with actin filament-severing activity, was chosen for its potential involvement in OG- as well as flagellin-triggered responses. Here we demonstrate that PCaP1 is required for late, but not early, responses induced by OGs and flagellin. Moreover, *pcap1* mutants, unlike the wild type, are impaired in the recovery of full responsiveness to a second treatment with OGs performed 24 h after the first one. Localization studies on PCaP1 upon OG treatment in plants expressing a functional PCaP1-GFP fusion under the control of PCaP1 promoter revealed fluorescence on the PM, organized in densely packed punctate structures, previously reported as microdomains. Fluorescence was found to be associated also with endocytic vesicles, the number of which rapidly increased after OG treatment, suggesting both an endocytic turnover of PCaP1 for maintaining its homeostasis at the PM and an OG-induced endocytosis.

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