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42 - The role of HPCA1 in ROS perception and long-distance signal propagation after wounding in *A. thaliana*

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Plant perception of abiotic stress can initiate long-distance signaling involving rapid systemic waves, that are hydraulic, electric, reactive oxygen species (ROS) and Ca²⁺ waves, triggering acclimation responses. Recent studies shed light on how apoplastic ROS accumulation is sensed along the signal path, altering cytosolic Ca²⁺ levels and involving membrane proteins. In this study, we investigate the role of the H₂O₂ receptor HPCA1 (H₂O₂-INDUCED Ca²⁺ INCREASES 1) in systemic ROS signaling in Arabidopsis. Analyses of stomatal movements in *hpca1* revealed that the mutant failed to respond to various stress conditions (leaf/root wounding or H₂O₂ treatment), with no stomatal closure observed, and displayed a partially closure impairment after ABA treatment, unlike the WT response. Stomatal ROS accumulation after wounding was visualized using the ROS indicator CM-H₂DCFDA, which showed a reduction of ROS accumulation within *hpca1* guard cells, compared to WT. Finally, to investigate whether HPCA1 is involved in ROS signal propagation, the analysis of ROS accumulation in whole seedlings after leaf or root wounding via CM-H₂DCFDA was performed. *hpca1* mutants showed reduced ROS accumulation compared to WT in both local and distal cotyledons, with a stronger impairment in the distal one, suggesting defective systemic signal propagation. Overall, evidence suggests that HPCA1 is a key regulator of ROS signaling and highlights its essential role in mediating systemic stress responses.