Arabidopsis thaliana is able to sense tomato Systemin promoting defense against fungal pathogens

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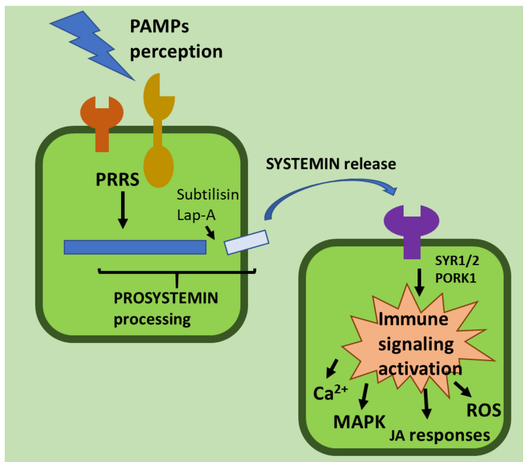
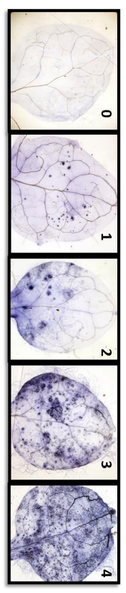
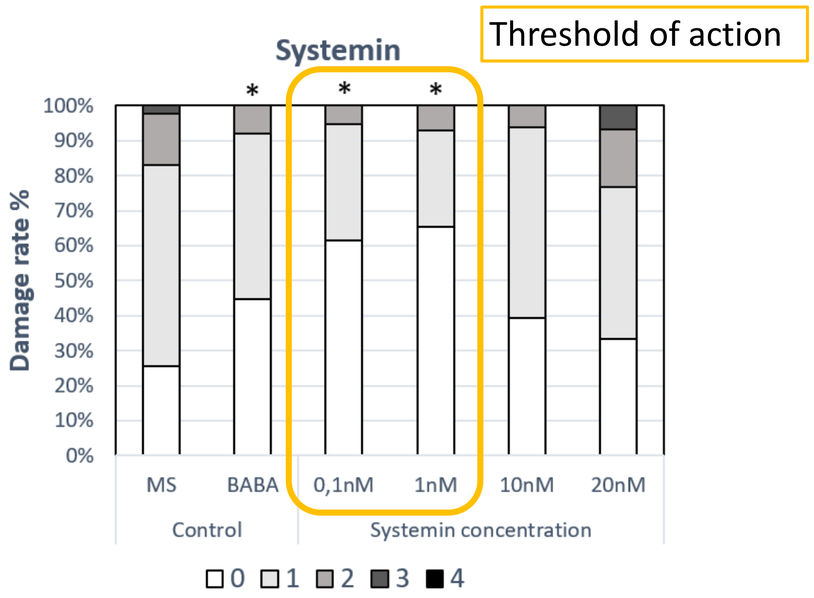
Systemin is a small tomato peptide that regulates the plant response against herbivores and pathogenic fungi. It is released from a larger precursor upon wounding or pathogen attack and binds to a membrane receptor of the adjacent cell inducing a cascade of plant defences, including JA-related responses, that lead to the accumulation of protease inhibitors in local and systemic tissue.

Although the tomato Systemin has been the focus of many recent studies, very little is known about the perception and function of Systemin in heterologous species.

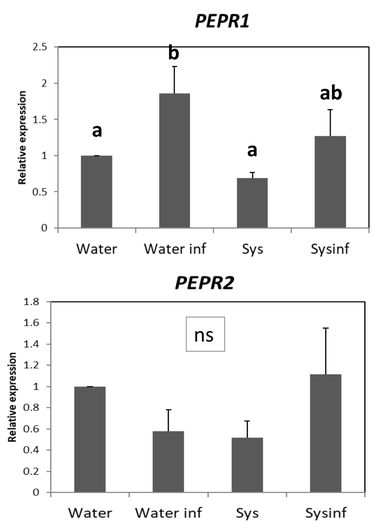


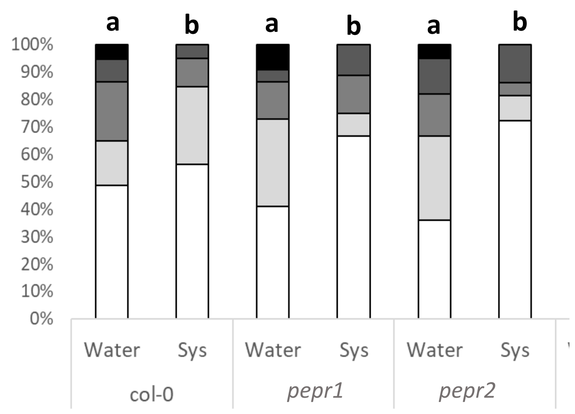
Systemin induces resistance against *P.cucumerina* displaying a threshold of action





Systemin perception in Arabidopsis is not through Pep1 receptors PEPR1 and PEPR2

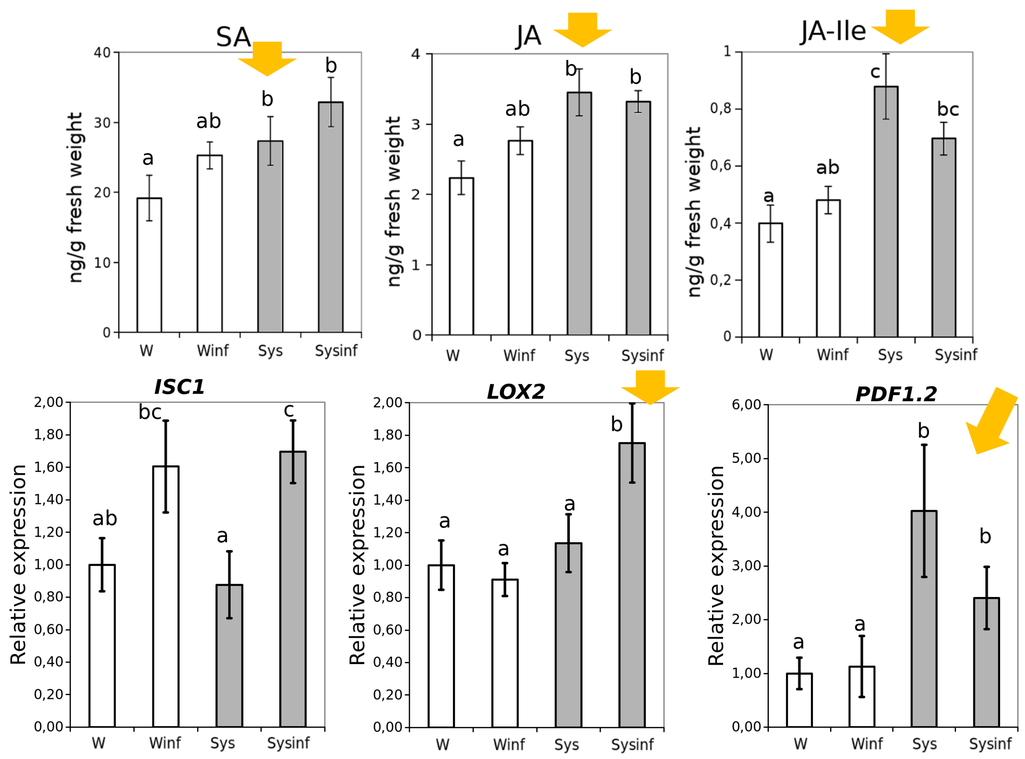




Mutants of Pep1 receptors were protected by Systemin

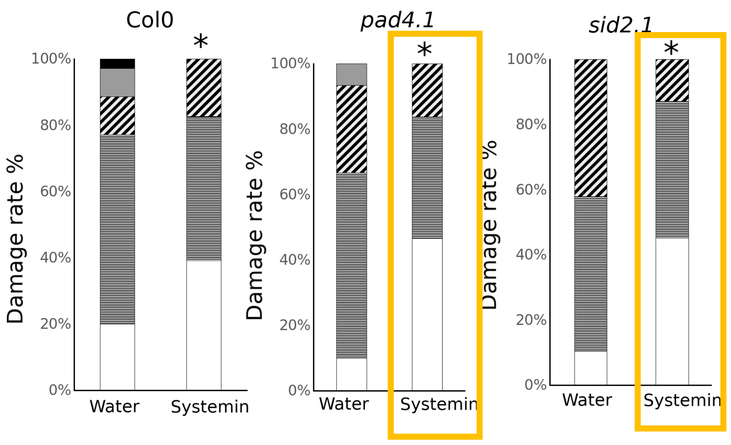
JA-Signaling plays an important role in Systemin induced resistance (Sys-IR)

Hormones from the main defense signaling pathways (JA and SA) were accumulated upon systemin treatment

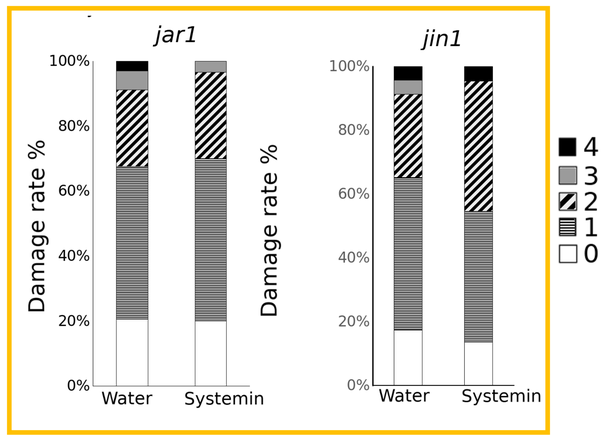


Only JA-related genes expression were higher in systemin treated plants after infection

Mutants of the SA pathway were protected by Systemin displaying a WT phenotype



Mutants of the JA pathway were impaired in Sys-IR



Conclusions

- Tomato Systemin is perceived by *Arabidopsis thaliana* inducing resistance against *Plectosphaerella cucumerina* infection.
- Sys-IR is modulated by JA-related responses in Arabidopsis as in tomato, sugestting that there are common signaling elements in response to Systemin in both species.

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SMALL MOLECULES IN PLANT RESEARCH:
Chemistry and Biology Come Together Symposium
Valencia, Spain
10 and 11 December, 2019