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## Maximizing plant's capacity to synthesize antimicrobial compounds

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The current era of increasing bacterial resistance along with consumers' negative perception on synthetic food preservatives and highly-processed foods have fuelled research on novel and natural alternatives of potent antibacterials. An attractive way to generate such antimicrobials is to make use of plants' weaponry. Plants generate such compounds as one of their defence responses. Legumes, specifically, are known to be excellent sources of antibacterials. Fungus-elicited soybeans seedlings, for example, synthesize a class of prenylated isoflavonoids*, glyceollins*, known to exert remarkable antibacterial properties [1]. The amount of generated antibacterials can be further enhanced when seedlings are primed prior to elicitation. Primed plants are shortly sensitized, being stimulated to respond more intensely towards subsequent fungal stress [2]. Priming before elicitation minimizes the fitness costs of the plants for resistance compared to direct elicitation [2]. Wounding, beneficial microbes or chemical compounds involved in plants' defence mechanism are mostly used as primers [3]. Reactive Oxygen Species (ROS), important key molecules in plants' defence, can be externally applied as an effective chemical primer. We found that priming of soybean seedlings with ROS prior to fungal elicitation significantly increases the glyceollin content compared to unprimed or wounding-primed seedlings. The effectiveness of ROS-priming was observed in two soybean cultivars with different genetic characteristics. ROS-priming provides opportunities for large-scale antimicrobial production due to its easiness of application and its increased robustness compared to solely fungus- or wounding-primed fungus-elicitation.

### References

[1] Araya-Cloutier C at al. *Food chemistry*, 2017; 226:193-201.
[2] Conrath U et al. *Molecular Plant-Microbe Interactions*, 2016; 19:1062-1071.
[3] Balmer A et al. *Trends in Plant Science*, 2015; 20:443-452.