

## **The place to be for metabolic engineering : the ER**

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### **Abstract:**

Across the plant kingdom, hormones such as jasmonate steer the delicate balance between growth and the activation of defense programs, including the production of bioactive specialized metabolites. Plant cells are capable of producing an overwhelming variety of (specialized) metabolites, both in terms of complexity and quantity. These small organic molecules allow plants to cope with various types of stresses and often also have biological activities of high interest to human. Yet, this impressive metabolic machinery is still hardly exploited, mainly because of the limited molecular insight into plant (specialized) metabolism.

By using cutting-edge functional genomics tools, in combination with reverse genetics screenings, we aim to characterize the molecular mechanisms driving plant natural product biosynthesis in crop, medicinal and model plants. Extensive gene collections are generated that allow increasing our fundamental understanding of the central mechanisms that steer hormone signalling in the context of plant growth and metabolism and that serve as a novel resource for metabolic engineering tools that will facilitate the sustainable production of bioactive plant-derived molecules. I will highlight the central role of the endoplasmatic reticulum in the organisation and regulation of plant specialized metabolism and present data on organelle-specific metabolic engineering in synthetic biology and gene discovery programs.