ABSTRACT

"Signaling peptides regulate plant tropic growth and root development"

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Plant growth and development are coordinated by an array of intercellular signals, including phytohormones and secreted peptides. A cursory analysis of plant genomes suggests that the role of the latter class of molecules may still be underestimated. Furthermore, while both classes can be implicated in the same developmental processes, little is known about the interplay between phytohormone action and peptide signaling within the cellular microenvironment. We have shown that plant-specific genes coding for small secretory peptides, designated GOLVEN (GLV), modulate the distribution of the phytohormone auxin in Arabidopsis. The deregulation of the GLV function impairs the formation of auxin gradients via PIN proteins, thereby altering the reorientation of shoots and roots after a gravity stimulus, affecting meristem size, or preventing the proper development of lateral roots. We have also identified proteolytic enzymes important for the production of the bioactive GLV signal and will discuss their potential regulation.

A complementary research project will be introduced. We have built a high-content screening platform to study the cellular phenotypes of isolated plant cells. This system has been optimized to track the proliferation of isolated Arabidopsis cells with high-throughput and robotized protocols. The properties of several molecules identified in large-scale screens will be described.