

gCOE セミナー

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タイトル:GOLVEN secretory peptides control plant gravitropism

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要旨

GOLVEN secretory peptides control plant gravitropism

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In a systematic reverse genetic screen for potential signaling peptides, we have identified a family of genes whose overexpression results in root agravitropic and wavy phenotypes. The family was called GOLVEN (GLV), meaning waves in Dutch. GOLVEN genes are specific to plants and code for small peptides that carry an N-terminal signal peptide and a C-terminal conserved motif, dubbed the GLV motif. When applied to Arabidopsis plantlets, short peptides derived from the GLV motif also induce dose-dependent agravitropic phenotypes. GLV gain- and loss-of-function mutants display root as well as hypocotyl gravitropic defects. Interestingly, GLV1 and GLV2 are transcribed asymmetrically in bending gravistimulated hypocotyls. This and further experiments investigating the potential mode of action of the GOLVEN proteins suggest that phytohormone activity can be modulated by secretory peptides and vice-versa. Such cross-talks might form regulatory feedback loops essential in complex signaling networks.