

CYTOKININ PATHWAYS REGULATING *MEDICAGO TRUNCATULA* SYMBIOTIC NODULE DEVELOPMENT

ARIEL F.***, PLET J.*, BRAULT-HERNANDEZ M.*, VERDNAUD M.***, CARRERE S.***,
GOUZY J.***, CHAN R.**, MATHESIUS U.****, CRESPI M.*, FRUGIER F.*

*) ISV, Institut des Sciences du Végétal, CNRS, Gif sur Yvette (France)

**) LBV, Laboratorio de Biotecnología Vegetal, Universidad Nacional del Litoral, Santa Fe,
(Argentina)

***) LIPM, Laboratoire des Interactions Plantes Micro-organismes, CNRS-INRA, Castanet-
Tolosan (France)

****) Australian Research Council, Centre of Excellence for Integrative Legume Research,
University of Canberra (Australia)

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Legumes can develop two types of root lateral organs depending on environmental conditions: lateral roots and nitrogen-fixing symbiotic nodules. Genetic data indicate that their development involves common regulatory pathways, including phytohormonal controls.

Cytokinin signalling mediated by the receptor MtCRE1 was indeed shown to be crucial for both organogeneses (1). A combination of mutant and cytokinin responsive gene analyses revealed their role in *M. truncatula* early nodule organogenesis in dividing cortical cells as well as in mature nodules in relation with the cell division and differentiation balance (2). We additionally characterized interaction of this pathway with auxin and ethylene. The CRE1 pathway is notably required to modulate polarized auxin transport and PIN proteins expression and accumulation.

Recently, we searched for genes directly regulated by the MtCRE1 cytokinin signalling pathway by a combination of biochemical, transcriptomic and bioinformatic approaches. Among the new cytokinin response genes able to act in legume roots, some could be directly linked to cytokinin metabolism, or to other cues required for nodule organogenesis. The relevance of this potential direct regulation by the cytokinin pathway in root and nodule development is currently analyzed.

Overall, we could pinpoint specificities of cytokinin signalling pathways acting in legume root and nodule development, and characterize new potential cytokinin primary response genes.

REFERENCES

1. Gonzalez-Rizzo *et al.* (2006), *Plant Cell* 18:2680-2693.
2. Plet *et al.* (2011) *Plant J.*, 65, 622-633.