

Features of the regulation of the transcription factor NIN, which determined its participation in the control of nodule organogenesis in legumes plants

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The transcription factor NIN (NODULE INCEPTION) is a master regulator of forming legume-rhizobial symbioses in plants. This transcriptional factor is the founder of the family of NIN-like proteins, which are widely represented in most part of groups of terrestrial plants, but only in legumes and some representatives of the *Rosales* was recruited to play a key role in the regulation of the development of rhizobial symbiosis. We assume that there are some features in the structure of the protein itself, which are associated with different co-regulators during various processes, which determines the selective involvement of NIN in the regulation of infection and organogenesis, and also there are many regulatory regions in the gene promoter that are associated with different TFs on different developmental stages of symbiosis.

We found that this protein may contain structural features in the form of a specific transcription factor amino acid pattern that was characteristic of legumes with an indeterminate nodule type. In addition, we conducted a search and analysis of promoter elements, which showed activity in the roots of non-legume plants.

In order to study the role of the identified promoter elements associated with cytokinins in the regulation of morphogenesis, we conducted an experiment on the treatment of mutant pea plants with exogenous cytokinins followed by transcriptomic analysis. As a result of this work, we have identified new target genes that can be activated by NIN in the control of later stages of nodule morphogenesis.

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