The molybdenum cofactor biosynthesis network: in vivo investigation of protein-protein-interactions

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Abstract

Survival of plants and almost all organisms depends on the pterin based molybdenum cofactor (Moco) as well as its effective biosynthesis and insertion into apo-enzymes. The most important molybdenum-containing enzyme (Mo-enzyme) in plants is the nitrate reductase. A loss of function prohibits nitrogen assimilation which is lethal. All Moco-biosynthesis enzymes are identified and the conserved four step reaction pathway is well-understood. However, Moco and its intermediates are highly oxygen sensitive. The protection mechanisms to prevent Moco degradation during biosynthesis and transfer to apo-enzymes are still a matter of discussion.

An efficient strategy for a protected metabolic channelling of sensitive molecules is complex assembly as well as transient protein-protein interaction. In this talk, a Moco biosynthesis and allocation network at the cytoskeleton will be proposed and discussed. The analyses of these interactions based on several *in vivo* interaction studies as powerful tools: bimolecular fluorescence complementation (BiFC) and split luciferase (FLuCI). The combination of these assays allows both the identification of one time only interactions and of stable protein complexes including the analysis of interaction strengths in the cell environment.