ABSTRACT

"Auxin homeostasis in plant cells: create, modify, and (re)distribute"

Prof Eva Zažímalová

Institute of Experimental Botany AS CR

Prague

CZECH REPUBLIC

Plant hormone auxin plays a role of the major coordinative signal in plant development. Formation of the auxin gradients results in differential stimulation of auxin signalling pathways and thus triggers off various growth responses. There is an increasing knowledge about the involvement of auxin in particular developmental processes, namely in Arabidopsis thaliana; however, much less information is available about the qualitative and quantitative aspects of auxin homeostasis control on the cellular and molecular levels. There are two possible basic processes which both contribute to the establishment and modulation of homeostasis of any compound: metabolism and transport. Auxin metabolism involves biosynthetic, conjugation/deconjugation and degradation processes which altogether result in specific auxin metabolic profile in particular cell (and its compartment) in particular time point. Auxin transport occurs not only across plasma membrane but also across intracellular membranes inside cells. Both metabolic and transport processes are species and cell-type specific. Single-cell-based systems allow tracking the course of auxin accumulation inside cells and determination and quantification of certain auxin transport parameters as well as auxin metabolic profiles. Experimental data can serve as a basis for mathematical modelling of processes involved in formation and maintenance of auxin homeostasis in cells.