Abstract

Auxins are a class of plant hormones (phytohormones) with their most frequently endogenously occurring representative indol-3-acetic acid (IAA). Because of their influence on division and elongation of cells, auxins play an important role in many developmental and physiological processes such as embryo development, vascular tissue patterning and tropisms. These effects are often mediated by polar auxin transport, which results in a wide variety of auxin concentrations in cells and entire tissues. Transport of auxin from cell to cell is partly mediated by diffusion, the prevalence of auxin transport is however mediated by auxin carriers located on plasma membrane (PM). Among such carriers belong AUX1/LAX (AUXIN RESISTANT 1/LIKE AUX1) transporter family, which helps with auxin influx and families of PIN-FORMED (PIN) and ABCB/PGP (ATP-binding cassette subfamily B/P-glycoprotein) transporters, which take part in auxin efflux. These proteins are in various degrees dependent on a system of membrane vesicles, trafficking along actin cytoskeleton, which ensures among others cycling of these vesicles among PM and endosomal cell space. Regulation of auxin transport is possible on multiple levels including influencing of gene expression for carrier proteins and regulation of their localization, activity and degradation. Auxin transport can even be regulated by auxin itself, both through its effects on gene expression of carrier proteins and its influence on shaping of actin filaments. Importance of cytoskeleton in auxin transport is studied through experiments with various inhibitors and is also described in this thesis. The aim of this thesis is to provide an up-to-date overview on the cytoskeleton-based mechanisms participating in the localization and regulation of function of auxin carriers in plants.

Key words: auxin, cytoskeleton, auxin carriers, vesicular trafficking, plasma membrane, endocytosis, exocytosis