

Abstract

Auxin, represented by the molecule indole-3-acetic acid (IAA), is one of the main phytohormones involved in the regulation of plant development. Its intercellular transport establishes concentration gradients in individual cells that control gene expression and a number of downstream processes. In plants, a complex mechanism for efficient IAA transport has evolved, involving both long-distance transport and intercellular transport within individual tissues. Because our understanding of the auxin transport mechanisms is still incomplete, this thesis attempts to summarize the literature data on all modes of auxin transport across cell membranes that have been recognized to date and places them in a broader evolutionary context. The presence of IAA in many prokaryotic and eukaryotic organisms, together with the similarly wide occurrence of carriers from “auxin efflux carrier” transporter family, evolutionarily related PIN-FORMED-like carriers, points to the possibility that IAA transport may also be evolutionarily very ancient and may functionally derive from more general mechanisms of ions or amino acids.