



ABSTRACT

"Auxin - cytokinin interaction shaping root architecture "

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Plant development is characterized by a continuous growth and flexible adjustments of the plant architecture in response to the environment. Plants are able to maintain permanent stem cell populations, dedifferentiate already committed cells and, not least, to regenerate or form organs *de novo*. These developmental processes are governed and coordinated by signalling substances called plant hormones. Typically, in certain developmental processes more than one hormone is involved and, thus, coordination of their overlapping activities is crucial for correct plant development. Multiple hormones including cytokinin and auxin have been implicated in the regulation of root development however, molecular mechanisms underlying the hormonal cross-talk are only poorly understood. The main aim of our studies is to reveal the molecular components and mechanisms balancing the output of auxin and cytokinin pathways in order to regulate plant organogenesis. We use lateral root organogenesis in *Arabidopsis* as an ideally suited model system for these questions, because it encompasses fundamental aspects of plant development, such as dedifferentiation, re-entry into the cell cycle, coordinated cell divisions and differentiation, and is in antagonistic manner regulated by auxin and cytokinin. Recent insights into mechanisms of auxin and cytokinin cross-talk during lateral root organogenesis will be discussed.