

## **DESCRIPTION FOR THE GENERAL PUBLIC**

Knowledge of the molecular mechanisms influencing the adaptation processes of plants to the constantly changing environment is incomplete. A particular example are processes that are distinguished by self-organization, such as the formation of vascular tissue and its regeneration in injured plant shoots. Both plant hormones - auxins, as well as intercellular communication and the response of individual cells to auxin play an important role here. Until now, it is known that the polar localization of PIN auxin transporters is rearranged in individual cells and leads to the formation of auxin transport channels.

How do individual cells perceive sources of auxin which are often found at long distances, and by what mechanisms does the PIN protein travel to the appropriate side of the cell? Is this due to auxin flow through the cell polarizing the PIN, or is the cell directing the PIN towards its low auxin neighbors? These questions still remain open.

Research has shown that some proteins can become auxin receptors and participate in the complicated molecular machinery of auxin transport and intracellular signaling. So far, a CAMEL-CANAR protein complex has been identified that has been found to be part of the auxin signaling pathway.

The essence of this project is research that may allow to solve several key aspects concerning the regulation of auxin transport in plant development processes and to obtain answers to the following scientific questions: 1/. whether the secreted protein CAMEL Ligand1 (CAL1) is a ligand of the CAMEL/CANAR complex; 2/ whether there is cooperation of auxin and CAL1 peptide signaling, 3/. whether there are other components of the CAL1/auxin signalling pathway, 4/. what is the function of all components in the formation and reconstruction of the conductive tissue.

The interdisciplinary research approach adopted in the project using Arabidopsis guarantees groundbreaking research results that will provide new information on the role of auxin in intercellular communication and building the hormonal response of cells during regenerative phenomena. The planned research will also allow the definition of the molecular factors involved in this auxin-dependent machinery. The acquired knowledge can be measurably used in further plant development research.