



Universiteit
Leiden

The Netherlands

Calcium-dependent regulation of auxin transport in plant development

Wei, X.

Citation

Wei, X. (2024, January 11). *Calcium-dependent regulation of auxin transport in plant development*. Retrieved from <https://hdl.handle.net/1887/3677385>

Version: Publisher's Version

License: [Licence agreement concerning inclusion of doctoral thesis in the Institutional Repository of the University of Leiden](#)

Downloaded from: <https://hdl.handle.net/1887/3677385>

Note: To cite this publication please use the final published version (if applicable).

Stellingen

Behorende bij het proefschrift

Calcium-dependent regulation of auxin transport in plant development

1. A confined clade of the CALMODULIN/CALMODULIN-LIKE (CaM/CML) family in Arabidopsis acts redundantly in interacting with and regulating the PINOID (PID) AGC protein kinase.

This thesis.

2. PID plasma membrane association and CML12/TCH3 binding converge on an amphipathic alpha-helix in the kinase insertion domain.

This thesis.

3. CaM/CML binding sequesters PID from the plasma membrane by shielding the positively charged arginines in the amphipathic alpha helix from the negatively charged plasma membrane.

This thesis.

4. Calcium-dependent regulation of PID kinase activity by CaM/CML binding is required for a robust spiral phyllotaxis in the Arabidopsis inflorescence.

This thesis.

5. A mathematical model taking into account dynamic patterns of both auxin maxima and mechanical forces will more accurately describe the spatiotemporal positional information for flower primordium initiation at the Arabidopsis inflorescence meristem.

This thesis; Galvan-Ampudia, 2020, eLife, 55832;
Sampathkumar, 2020, Development 147, dev177964.

6. AGC kinase-directed PIN polarity and downstream auxin transport are not dispensable for a robust rosette leaf phyllotaxis in Arabidopsis.

Guenot et al., 2012, Plant Physiol., 159, 1501-1510; Fan, 2014, PhD Thesis, Leiden University.

7. The recent identification of new auxin signaling pathways in addition to the canonical nuclear one finally provides mechanical insight into rapid (seconds) auxin responses.

Caumon and Vernoux, 2023, J. Exp. Bot., erad132.

8. Utilizing external mechanical stimuli or tracking the spatiotemporal dynamics of mechanical forces may offer a productive approach to deconstruct the molecular mechanisms underlying tissue morphogenesis and identify the core players.

Sampathkumar, 2020, Development, 147, dev177964;
Baral et al., 2021, Dev. Cell, 56, 67-80.

9. The AUXIN BINDING PROTEIN 1 (ABP1) story is in line with the quote: “when you come out of the storm, you won’t be the same protein/person who walked in”.

Haruki Murakami, Kafka on the Shore

10. Doing a PhD consists of 10% challenges and 90% how you respond to them.

Xiaoyu Wei

Leiden, 11 January 2024