Graduate School Event

The cAMP second messenger in auxin signalling

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Host: Sandra Siegert

Auxin regulates plant development through dual pathways: canonical transcriptional regulation (TIR1-mediated Aux/IAA degradation releasing ARFs) and AFB1-driven rapid non-transcriptional responses. This study reveals functional specialization between homologous receptors: TIR1 operates in the nucleus for transcriptional activation, while AFB1 mediates cytoplasmic rapid responses via subcellular compartmentalization and intrinsic biochemical features. Nuclear-localized AFB1 fails transcriptional regulation due to defective SCF complex assembly.Crucially, TIR1's adenylate cyclase activity generates cAMP as a secondary messenger. cAMP activates ARFs independently of Aux/IAA degradation by directly binding ARFs, promoting their dissociation from repressors and enhancing homodimerization. Genetic and biochemical analyses confirm cAMP-ARF interaction is essential for transcriptional activation.These findings establish a parallel TIR1-cAMP-ARF axis, revising the classical auxin signaling model. The study uncovers receptor specialization through spatial segregation and biochemical divergence, while identifying cAMP as a novel mediator linking auxin perception to transcriptional reprogramming. This dual regulatory framework advances understanding of hormonal signaling complexity in plants.

Tuesday, March 25, 2025 02:00pm - 03:00pm
Sunstone Bldg / Ground floor / Big Seminar Room B (I23.EG.102)

This invitation is valid as a ticket for the ISTA Shuttle from and to Heiligenstadt Station.
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https://ista.ac.at/en/campus/how-to-get-here/ The ISTA Shuttle bus is marked ISTA Shuttle (#142) and has the Institute Logo printed on the side.