



Arabidopsis WAT1 is a vacuolar auxin transport facilitator required for auxin homeostasis

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Résumé en anglais	<p>The plant hormone auxin (indole-3-acetic acid, IAA) has a crucial role in plant development. Its spatiotemporal distribution is controlled by a combination of biosynthetic, metabolic and transport mechanisms. Four families of auxin transporters have been identified that mediate transport across the plasma or endoplasmic reticulum membrane. Here we report the discovery and the functional characterization of the first vacuolar auxin transporter. We demonstrate that WALLS ARE THIN1 (WAT1), a plant-specific protein that dictates secondary cell wall thickness of wood fibres, facilitates auxin export from isolated Arabidopsis vacuoles in yeast and in <i>Xenopus</i> oocytes. We unambiguously identify IAA and related metabolites in isolated Arabidopsis vacuoles, suggesting a key role for the vacuole in intracellular auxin homeostasis. Moreover, local auxin application onto <i>wat1</i> mutant stems restores fibre cell wall thickness. Our study provides new insight into the complexity of auxin transport in plants and a means to dissect auxin function during fibre differentiation.</p>
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