

**P004** Microtubule-associated AIR9 required for pollen germination and ovule development

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The auxin-inducible *AIR9* gene encodes a microtubule-associated protein present in land plants including mosses. We previously studied GFP-AIR9 during somatic cell division and found the protein interacts with microtubules through its N-terminal domain. However, a large C-terminal fragment of the protein localizes to the plasma-membrane and recognizes the plane of cell division. GFP-AIR9 does not label spindle microtubules.

To deepen our understanding of *Arabidopsis AIR9* we analyzed insertional mutants. Alleles *air9-1* and *ungud9* are specifically defective in pollen germination. However, growth of the pollen tube is normal, as are the nuclear divisions during pollen development. The pollen germination defect is mimicked by inhibitors of vesicle trafficking. *ungud9* shows additional phenotypes in ovule development, with major defects in patterning and differentiation. *ungud9* female gametophytes retain the ability to complete cytokinesis, but the nuclei are ill-positioned and do not differentiate. Yeast-2-hybrid analyses suggest that AIR9 interacts with the mitotic kinesin ZWICHEL. This interaction is confirmed *in vitro*. We find that *zwichel* mutants show defects in pollen germination similar to *air9*. Nuclear divisions in developing pollen of *zwichel* appear normal, however, pollen germination of the homozygous mutant is reduced to 32%. We speculate that AIR9 interacts with ZWICHEL to function in a microtubule-dependant vesicle trafficking mechanism.