

# *Small Auxin Up RNAs (SAURs) in Arabidopsis thaliana*

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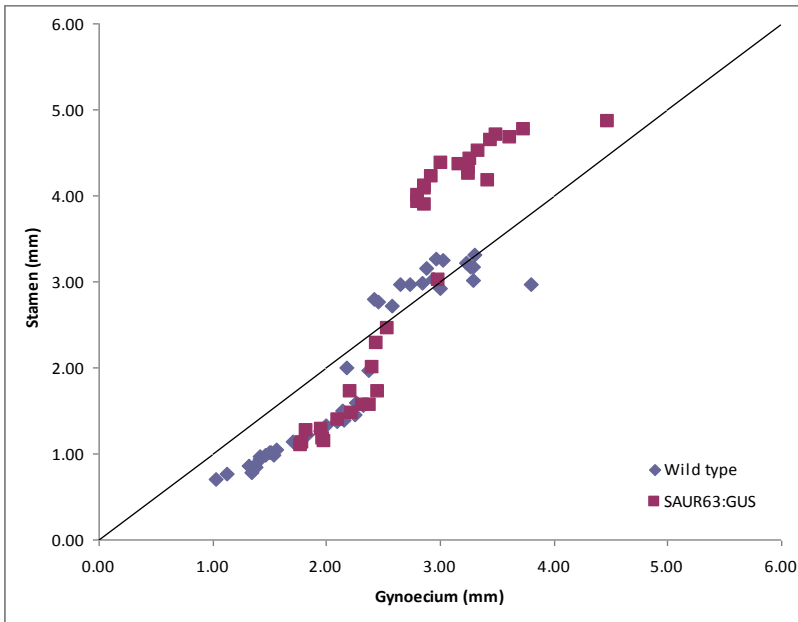
**Project Background:** *Small Auxin Up RNAs (SAURs)* are a family of primary auxin-responsive genes of unknown biochemical and developmental function. Auxin is a plant phytohormone implicated in diverse developmental processes including gravitropism, embryo patterning, and apical dominance. Our previous studies suggest a possible role of SAUR proteins in polar auxin transport (PAT), a complex system responsible for the establishment of developmentally important auxin gradients.

**Project Aim:** To better identify and characterize the function of SAUR proteins, and to integrate these results with existing knowledge of auxin signaling and response pathways to generate a more robust understanding of how auxin regulates plant growth and development. Specific objectives this summer included:

- Localization of SAUR fusion proteins (SAUR63:GFP) via confocal fluorescence microscopy
- Better characterization of SAUR gain-of-function phenotypes to place SAUR action in a developmental context
- Establishment of various transgenic lines to serve as tools for more advanced analysis of SAUR function

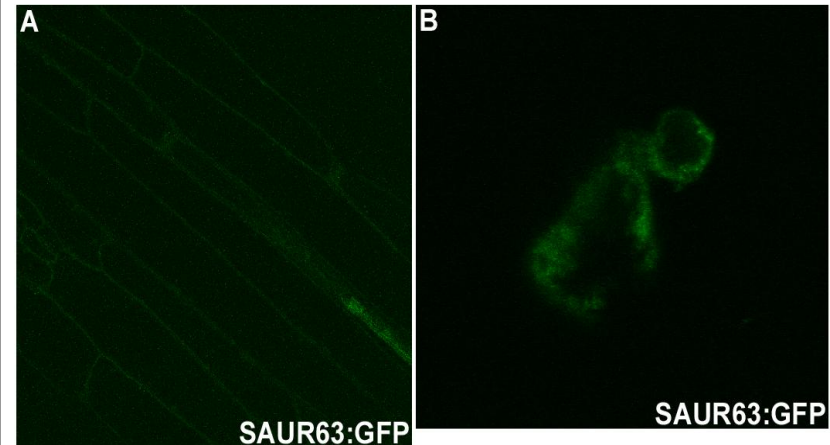
# Results

## Phenotypic Analysis



SAUR gain-of-function lines have flowers with significantly elongated petals and stamen filaments. However, time of anther dehiscence is not affected; stamen elongation occurs within the correct developmental timeframe.

## SAUR Localization



SAUR63:GFP signal is strongest in the outer cortex of hypocotyls (A); the signal (green) appears to localize to the plasma membrane. Protoplast isolation and visualization suggests peripheral association of SAUR63:GFP with the cell membrane (B), although some signal was observed in the cytoplasm. The C-shaped pattern is a result of membrane rupture due to experimental conditions.

These results expand our understanding of SAUR activity and support our hypothesis that SAURs participate in auxin transport, as many auxin transport proteins also localize to the cell membrane of hypocotyl cortex cells. We have also isolated numerous SAUR fusion lines crossed with various epitope-tagged auxin transport proteins. These lines will allow us to observe the effects of increased SAUR activity on the expression and localization of known auxin transporters, as well as perform various co-localization and co-immunoprecipitation assays.