

Molecular mechanism of a protein that regulates endoreduplication and cell growth in *Arabidopsis*

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Arabidopsis thaliana inflorescencias. Credit: Wikimedia Commons, [CC BY-SA](#)

Endoreduplication is an alternative version of the classical cell cycle during which cells replicate their nuclear DNA without subsequently dividing, thereby increasing their ploidy level. This process occurs in a variety of cell types and contributes to normal growth and development of plant cells as well as plant responses to biotic and abiotic stresses. However, the underlying mechanism for endoreduplication remained elusive.

SNW/SKI-INTERACTING PROTEIN (SKIP) acts as a component of spliceosome and a transcriptional co-regulator of a number of key cellular signaling molecules to be involved in regulation of plant growth and development. However, the role of SKIP in endoreduplication control has not been reported so far.

A joint research team led by Prof. Li Yunhai at the Institute of Genetics and Developmental Biology of the Chinese Academy of Sciences, Profs. Song Chunpeng and Guo Siyi at the Henan University, have recently revealed the [molecular mechanism](#) of an SNW/SKI-INTERACTING PROTEIN in regulation of endoreduplication and [cell growth](#) in Arabidopsis.

Previously, Prof. Li Yunhai's team has reported UBIQUITIN-SPECIFIC PROTEASE 14 (UBP14) encoded by DA3 interacts with ULTRAVIOLET-B INSENSITIVE4 (UVI4) to regulate endoreduplication and cell and organ growth in Arabidopsis. Then the regulatory cascade for UBP14/DA3-CDKB1;1-CDKG2/SUD6-mediated control of endoreduplication and cell growth in Arabidopsis was established.

In this study, the researchers discovered another suppressor of da3-1 (sud3) mutation suppressed the da3-1 phenotype. SUD3 encodes SKIP. Overexpression of SKIP/SUD3 significantly increases ploidy level, indicating that SKIP/SUD3 is a positive regulator of endoreduplication.

SUD3 physically interacts with DA3 and UVI4 in vitro and in vivo. Genetic analyses support that SUD3 acts in the downstream of DA3 and UVI4 to control endoreduplication and cell growth.

In conclusion, this work reveals an important genetic and molecular mechanism by which SKIP/SUD3 associates with UBP14/ DA3 and UVI4 to modulate endoreduplication and cell growth in Arabidopsis.

This work, titled "An SNW/SKI-INTERACTING PROTEIN influences endoreduplication and cell growth in Arabidopsis," was published in *Plant Physiology* on Sept. 5, 2022.

More information: Shan Jiang et al, An SNW/SKI-INTERACTING PROTEIN influences endoreduplication and cell growth in Arabidopsis, *Plant Physiology* (2022). [DOI: 10.1093/plphys/kiac415](https://doi.org/10.1093/plphys/kiac415)

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