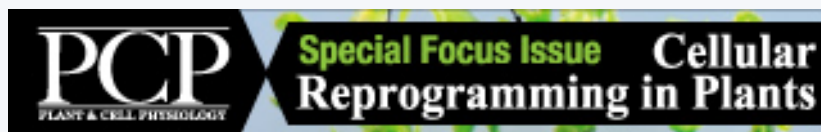


gene of *Arabidopsis thaliana*, required for formation of a symmetric flat leaf lamina, encodes a member of a novel family of proteins characterized by cysteine repeats.

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The *ASYMMETRIC LEAVES2* Gene of *Arabidopsis thaliana*, Required for Formation of a Symmetric Flat Leaf Lamina, Encodes a Member of a Novel Family of Proteins Characterized by Cysteine Repeats and a Leucine Zipper FREE

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Plant and Cell Physiology, Volume 43, Issue 5, 15 May 2002, Pages 467–478,
<https://doi.org/10.1093/pcp/pcf077>

Published: 15 May 2002

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Abstract

The *ASYMMETRIC LEAVES2* (*AS2*) gene of *Arabidopsis thaliana* is involved in the establishment of the leaf venation system, which includes the prominent midvein, as well as in the development of a symmetric lamina. The gene product also represses the expression of class 1 *knox* homeobox genes in leaves. We have characterized the *AS2* gene, which appears to encode a novel protein with cysteine repeats (designated the C-motif) and a leucine-zipper-like sequence in the amino-terminal half of the primary sequence. The *Arabidopsis* genome contains 42 putative genes that potentially encode proteins with conserved amino acid sequences that include the C-motif and the leucine-zipper-like sequence in the amino-terminal half. Thus, the *AS2* protein belongs to a novel family of proteins that we have designated the *AS2* family. Members of this family except *AS2* also have been designated *ASLs* (*AS2*-like proteins). Transcripts of *AS2* were detected mainly in adaxial domains of cotyledonary primordia. Green fluorescent protein-fused *AS2* was concentrated in plant cell nuclei. Overexpression of *AS2* cDNA in transgenic *Arabidopsis* plants resulted in upwardly curled leaves, which differed markedly from the downwardly curled leaves generated by loss-of-function mutation of *AS2*. Our results suggest that *AS2* functions in the transcription of a certain gene(s) in plant nuclei and thereby controls the

formation of a symmetric flat leaf lamina and the establishment of a prominent midvein and other patterns of venation.

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