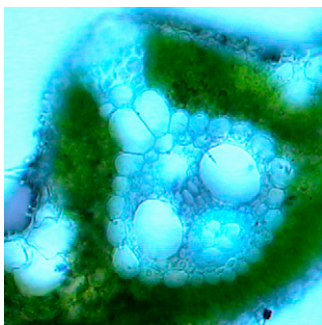


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ON THE COVER



Rice leaf development is important for photosynthesis and, hence, grain yield. Zhang et al. (pages 719–735) show that SHALLOT-LIKE1 (SLL1), a SHAQKYF class MYB family transcription factor belonging to the KANADI family, modulates leaf abaxial cell development and sustains the abaxial characteristics during leaf development. SLL1 deficiency leads to defective programmed cell death of abaxial mesophyll cells and results in increased chlorophyll and photosynthesis, which may facilitate attempts to increase the photosynthetic capacity of rice. The cover image shows the defective sclerenchymatous cells on the abaxial side of *sll1-1* leaves resulting in a broader distribution of mesophyll cells.

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Gregory Bertoni (2008). Dynamic Evolution of *Oryza* Genomes. *Plant Cell* 20: 3184. 1021

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