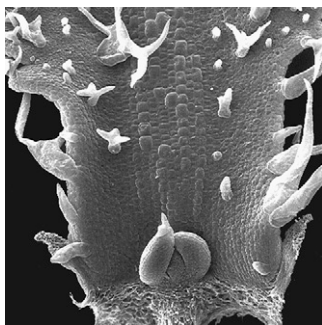


T H E
PLANT
C E L L

Volume 19 Number 2 February 2007

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ON THE COVER



A shoot axillary bud will either grow out to produce a branch or remain dormant in the leaf axil, depending on the integration of endogenous and environmental stimuli mediated by hormonal signals. Aguilar-Martinez et al. (pages 458–472) report on *Arabidopsis* *BRANCHED1* (*BRC1*), which encodes a TCP transcription factor closely related to maize *teosinte branched1* (*tb1*). The authors show that, like *tb1*, *BRC1* constitutes a key point at which signals controlling branching are integrated within axillary buds. *BRC1* is expressed in developing axillary buds and functions to arrest bud development in response to developmental and environmental stimuli. It has previously been found that long-range signaling promoting axillary bud arrest is controlled both by auxin produced in the shoot apex and by a novel carotenoid derivative called the MAX-dependent signal synthesized in the root. Mutant and expression analyses show that *BRC1* functions downstream of the MAX pathway and also is required for auxin-induced apical dominance. The cover image shows a scanning electron micrograph of a young axillary bud in the axil of a wild-type *Arabidopsis* rosette leaf.

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Jayne Griffiths, Kohji Murase, Ivo Rieu, Rodolfo Zentella, Zhong-Lin Zhang, Stephen J. Powers, Fan Gong, Andrew L. Phillips, Peter Hedden, Tai-ping Sun, and Stephen G. Thomas (2006). Genetic Characterization and Functional Analysis of the GID1 Gibberellin Receptors in *Arabidopsis*. *Plant Cell* 18: 3399–3414. 726

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The Plant Cell (ISSN 1040-4651, online ISSN 1531-298X) is published monthly (one volume per year) by the American Society of Plant Biologists, 15501 Monona Drive, Rockville, MD 20855-2768, and is produced by Dartmouth Journal Services, Waterbury, VT. The institutional price for the print and online versions is based on type of institution; contact institution@aspb.org. A subscription includes both *The Plant Cell* and *Plant Physiology*; single copies may be purchased for \$75 each, plus \$7 shipping (U.S.) or \$9 (outside U.S.). Members of the American Society of Plant Biologists may subscribe to *The Plant Cell* for \$160. Nonmember individuals may subscribe for \$325. For matters regarding subscriptions, contact Suzanne Cholwek, ASPB, 15501 Monona Drive, Rockville, MD 20855-2768; telephone 301/251-0560, ext. 141; fax 301/251-6740; e-mail scholwek@aspb.org. Notify ASPB in writing within 3 months (domestic) or 6 months (foreign) of issue date, and defective copies or copies lost in the mail will be replaced. Send all inquiries regarding display advertising to Brett Goldfine, Leonard Media Group, PO Box 220, 415 Horsham Road, Horsham, PA 19044; telephone 215/675-9133, ext. 226; fax 215/675-9376; e-mail brett@leonardmedia.com. Periodicals postage paid at Rockville, MD 20850, and at additional mailing offices.

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