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A grayscale, high-magnification micrograph of a plant stem, likely Arabidopsis, showing numerous root hairs extending from the surface. The stem is oriented vertically, and the root hairs are distributed along its length, some appearing as small, rounded tips and others as more elongated structures. The background is dark, making the light-colored stem and root hairs stand out.

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ARABIDOPSIS CAP1 FUNCTIONS IN THE TIP GROWTH OF ROOT HAIRS

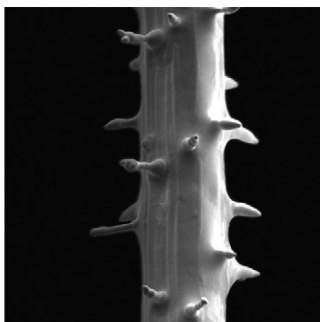
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ON THE COVER



Cells must sense and regulate their internal NH_4^+ levels to modulate nitrogen levels and avoid NH_4^+ toxicity. Bai et al. (pages 1497–1511) identify an *Arabidopsis* $[\text{Ca}^{2+}]_{\text{cyt}}$ -associated protein kinase (CAP1), a receptor-like kinase that mediates NH_4^+ homeostasis. CAP1 also regulates the polar growth of root hairs by maintaining tip-focused cytoplasmic Ca^{2+} gradients. The *cap1-1* mutation specifically affects root hair tip elongation and the morphology of root hairs on Murashige and Skoog medium and produces elevated levels of cytoplasmic NH_4^+ . Ammonium depletion from the medium reestablished the Ca^{2+} gradient necessary for normal root hair tip growth in the mutant. The image shows abnormal root hairs in a *cap1-1* mutant grown on Murashige and Skoog medium.

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