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On the Cover: In common with land plants, homogalacturonans (HGs) constitute a major fraction of the cell wall of the Charophycean green alga *Penium margaritaceum*. These pectin macromolecules form the fibrillar outer layer that anchors into the inner cellulose-rich stratum (background image). HG secretion during cell development may be monitored in live cells labeled with anti-HG monoclonal antibodies (e.g. LM18, JIM5). In LM18-labeled cells (center, top), the HGs of older cell wall regions are displaced outward toward the polar zones. JIM5-labeled cells treated for 24 h with 0.28 μM of the microtubule inhibitor oryzalin show distinct swelling of the cell center and alteration of HG microarchitecture. Sørensen et al. (pp. 366–372) analyze cell wall macromolecule distribution and evolutionary trends in primitive land plants and their ancestral stock, the Charophycean green algae. *Penium* represents a unicellular model charophyte that provides important insight into cell wall dynamics and evolution. Microscopic imaging and cover design by David Domozych.

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^[W] Indicates Web-only data.

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