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Metabolic Organization during Secondary Cell Wall Synthesis

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On the Cover: Secondary cell walls are of immense importance to our society as they provide raw material for the paper, textile, biomaterial, and fuel sectors. Secondary cell walls also sustain plant growth and the water-transporting capacity of the vasculature that support water and nutrient transport from the root to the aerial parts of a plant. A better understanding of how secondary walls are made is therefore of utmost importance. Li et al. (Vol. 172, pp. 1334–1351) and Ohtani et al. (this issue, pp. 1612–1624) used inducible secondary wall systems to explore metabolite and transcript changes after the onset of secondary wall production. They found dynamic changes associated with many different classes of metabolites, in particular amino acid biosynthesis and hormone signaling. These changes were put in context to transcript changes during the induction to generate a comprehensive map of how cells re-program to change their developmental fates. These data will lay a foundation for a better understanding of how secondary walls are synthesized in plants. The cover image shows an induced seedling that was torn to expose a secondary wall structure of a proto-xylem converted cell. The image was captured using a Olympus BX-51 epi-fluorescence microscope using a 20× lens and was generated by Dr. Rene Schneider at the University of Melbourne.

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