ON THE COVER

Wood is formed by the successive addition of secondary xylem, which consists of cells with a conspicuously thickened secondary wall composed mainly of lignin and cellulose. Mitsuda et al. (pages 270–280) show that two plant-specific transcription factors, NAC SECONDARY WALL THICKENINGS PROMOTING FACTOR1 (NST1) and NST3, are key regulators of the formation of secondary walls in woody tissues of Arabidopsis. Experiments with both loss- and gain-of-function mutants suggest that NST1 and NST3 function redundantly to promote secondary wall thickening in interfascicular fibers and secondary xylem. Putative orthologs of NST1 and NST3 present in the genome of poplar suggest that they might also function as key regulators of the formation of secondary walls in trees and could be used as a tool for the genetic engineering of wood and its derivatives. The cover image shows an autofluorescent image of lignin in a cross section of root hypocotyl of the nst1-1 nst3-1 double mutant. Lignified secondary xylem was never observed, whereas lignification of vascular vessels was not affected, showing up as a fireworks-like display of fluorescent spots.

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