ABSTRACT

"Transcriptional regulatory network for woody cellulosic biomass/secondary cell wall production"

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Woody cellulosic biomass derived from plant secondary cell walls is one of the most widely utilized natural materials on our planet. Recent researches found several key regulatory genes controlling xylem cell differentiation, such as NAC (VND7, NST1, SND1, etc) and myb (MYB46, MYB83, etc) transcription factors, which comprise a fine transcriptional regulatory network. Based on the finding, we have established several experimental systems for analyzing secondary cell wall formation: Arabidopsis plants and BY-2 cells expressing the VND7 fused to a glucocorticoid-receptor inducibly produce secondary cell walls. I would like to discuss about the possibility to modify quantity and quality of woody biomass using such the basic knowledge.

Ohtani et al. (2011) A NAC domain protein family contributing to the regulation of wood formation in poplar. ***Plant J*** 67: 499-512.

Yamaguchi et al. (2010) VASCULAR-RELATED NAC-DOMAIN6 and VNSCULAR-RELATED NAC-DOMAIN7 effectively induce transdifferentiation into xylem vessel elements under control of an induction system. ***Plant Physiol*** 153: 915-924.

M. Kubo et al. (2005) Transcription switches for protoxylem and metaxylem vessel formation. ***Genes Dev.*** 19: 1855-1860.