

Identification of Cell Wall Synthesis Regulatory Genes Controlling Biomass Characteristics and Yield in Rice (*Oryza sativa*)

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Understanding the regulatory mechanisms of cell wall synthesis is essential for the improvement of biomass characteristics critical to biofuel production. To study the cell wall synthesis regulation, we are examining the cell wall regeneration process in protoplasts of rice (*Oryza sativa*). In protoplasts, the cell wall synthesis is highly activated due to the removal of cell wall. We are analyzing the transcriptome and proteome dynamic changes in response to the removal of cell wall using DNA oligo array and shotgun proteomics, respectively. The differentially regulated genes and proteins are further analyzed using systems biology method to elucidate possible pathways involved in cell wall synthesis and regeneration. In addition, mutants and transgenic lines of putative regulatory genes and critical metabolic pathway genes have been generated. Some of the mutants/transgenic lines have displayed changes in cellulose, hemicelluloses and lignin contents.