

Effects of hypergravity stimulus on the expression level of genes responsible for lignin formation in *Arabidopsis thaliana*

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Secondary cell walls contribute mechanical strength to plant bodies. Deposition of lignin in secondary cell walls has been considered to be prerequisite for the evolution of land plants. In the present study, we examined the effects of hypergravity conditions on lignin deposition in secondary cell walls of *Arabidopsis* (*Arabidopsis thaliana* L.) inflorescence stems. Plants were grown for 3 days after exposure to basipetal hypergravity at 300 x *g* for 24 h. A secondary cell wall fraction was prepared by enzyme digestion of inflorescence stem segments to remove primary cell wall components. The content of lignin in a secondary cell wall fraction was significantly increased by hypergravity stimulus. Microarray analysis (22K) was used to identify genes that are modulated in expression in response to hypergravity conditions. The results showed that many genes putatively involved in lignin biosynthesis were expressed more than 2-fold by hypergravity treatment. These data indicate that hypergravity-induced increase in the content of the constituents of secondary cell walls is attributed to increase in the expression level of genes responsible for the formation of secondary cell walls under hypergravity conditions.