

Poster Session (P)
Poster Lunch (1)

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THE IMPACT OF SPACE ENVIRONMENT ON GENE EXPRESSION IN ARABIDOPSIS THALIANA SEEDLINGS

Abstract

The effect of the space environment on gene expression in higher plants was tested using *Arabidopsis thaliana* seedlings grown in a biological incubator aboard SZ-8 spacecraft. Three groups of plants were grown in the following three conditions, respectively: (1) in spaceflight (F g), (2) under 1g centrifugal force in space (F 1g), and (3) under 1g on the ground as control (G 1g). Plant materials in space were fixed using RNAlater, in order to accurately preserve gene expression patterns developed in that environment. We screened the genetic differences under space environment. The results of microarray analysis validated by real-time PCR showed that microgravity affected *Arabidopsis* gene expression. There were 368 genes with significant expression under microgravity, 249 genes with significant expression changes due to factors in the space environment other than microgravity, and a total of 621 genes with significant changes in expression under the influence of all (integrated) space environmental factors. Among the differentially expressed genes impacted by the three respective factors (microgravity, other space environment factors other than microgravity, and integrated space environmental factors), some were unique to one of the three factors, while others were not. There were 18 differentially expressed genes shared by all three factors, reflecting the synergistic and antagonistic effects of microgravity and other space environmental factors on the plants.