

SPACE LIFE SCIENCES SYMPOSIUM (A1)
Biology in Space (8)

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STUDIES OF PLANT GENE EXPRESSION AND FUNCTION STIMULATED BY SPACE
MICROGRAVITY**Abstract**

One of the important questions in space biology is how plants respond to an outer space environment i.e., how genetic expression is altered in space microgravity. In this study, the transcriptome of *Arabidopsis thaliana* seedlings was analyzed as part of the Germany SIMBOX (Science in Microgravity Box) spaceflight experiment on Shenzhou 8. A gene chip was used to screen gene expression differences in *Arabidopsis thaliana* seedlings between microgravity and 1g centrifugal force in space. Microarray analysis revealed that 368 genes were differentially expressed. Gene Ontology (GO) analysis indicated that these genes were involved in the plant's response to stress, secondary metabolism, hormone metabolism, transcription, protein phosphorylation, lipid metabolism, transport and cell wall metabolism processes. Real time PCR was used to analyze the miRNA expression including *Arabidopsis* miR160, miR161, miR394, miR402, miR403, and miR408. MiR408 was significantly upregulated. An overexpression vector of *Arabidopsis* miR408 was constructed and transferred to *Arabidopsis* plant. The roots of plants over expressing miR408 exhibited a slower reorientation upon gravistimulation in comparison with those of wild-type. This result indicated that miR408 could play a role in root gravitropic response.