

SPACE LIFE SCIENCES SYMPOSIUM (A1)
Fundamental Gravitational Biology (7)

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EXPRESSION OF ICAM-1 AND VCAM-1 IN HUMAN UMBILICAL VEIN ENDOTHELIAL CELLS
UNDER SIMULATED MICROGRAVITY**Abstract**

By using FACS-analysis and immunohistochemical staining, we have studied the constitutive and TNF- α induced expression of ICAM-1 and VCAM-1 in human umbilical vein endothelial cells (HUVECs) exposed to simulated microgravity (SG). Untreated HUVECs did not contain detectable amounts of VCAM-1, but were ICAM-1 positive. After 5min or 30 min of clinorotation by RCCS (rotary cell culture system, NASA) at 15rpm, ICAM-1 expression on the cell membrane increased, while no significant change in VCAM-1 expression can be found. However, SG treatment for cultured cells activated by TNF- α at a low (10ng/ml) concentration, reduced VCAM-1 expression but caused an increase of ICAM-1 expression. With 24h or 48h SG treatment, ICAM-1 expression on the membrane of HUVECs without TNF- α stimulation increased, while VCAM-1 expression significantly decreased; and same trend was observed for the group with 24h or 48h SG treatment and TNF- α (10ng/ml) stimulation. ICAM-1 clustering of SG group with TNF- α (10ng/ml) were observed, as compared with the group with TNF- α stimulation but without SG treatment by immunofluorescence and laser confocal microscopy. Both ICAM-1 and VCAM-1 expression on endothelial cells(EC) is a pivot for WBC transendothelial migration(TEM). Our results showed different trends of ICAM-1 and VCAM-1 expression with SG treatment which suggest that the signal transduction pathways are different for ICAM-1 and VCAM-1 expression under SG treatments. How do these different trends affect the immunology function is waiting for a deep investigation.

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