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Biology in Space (7)

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ACTIVATION OF T CELL SUBSET IS INHIBITED AFTER A PRE-EXPOSURE TO MODELED
MICROGRAVITY AT RESTING STATE IN AN EXPOSURE-TIME DEPENDENT MANNER**Abstract**

Decline immune function is well documented during and after spaceflights. Microgravity is one of the key factors directly suppressing the function of immune system. T lymphocyte activation plays an important role on immune response. Studies have demonstrated that T cell response to stimuli was inhibited when cultured in real microgravity or a ground based model system. Circulating T cells are, however, maintained in a resting state and their growth and differentiation are strictly regulated under normal conditions. It is not clearly whether activation would be inhibited after a pre-exposure of microgravity on T lymphocytes at the resting state. Here, we investigated the details by measuring the responses of resting T cells to concanavalin A (ConA) after 0h, 8h, 16h and 24h pre-exposure of modeled microgravity (MMg) using a rotary bioreactor system. The T cells exhibited depressed activation-marker expression, cytokine secretion and proliferation in response to ConA after the MMg pre-exposure. Most importantly, the cell proliferation was suppressed in an MMg-exposure-time dependant manner, which might be associated, in large partly, with the low expressions of CD25, CD69 and CD71. Moreover, the proliferation of CD4+T cells was more sensitive to the microgravity inhibition than that of CD8+ T cells.