

SPACE LIFE SCIENCES SYMPOSIUM (A1)

Poster Session (P)

Author: Ms. Tong Hao
China, little.koala@163.com

RESEARCH ON TWO TYPES OF POLYSACCHARIDES AGAINST LYMPHOCYTES
IMMUNOSUPPRESSION IN SIMULATED MICROGRAVITY ENVIRONMENT.

Abstract

One of the significant responses for astronauts' space flight is that the microgravity environment affects the immune system. There were many interventions for enhancing the astronauts' immune function. Since space flight studies is limited, contemporary research must rely on validated ground-based models of microgravity, rotary cell culture system (RCCS) was developed more than a decade ago at John Space Center and can achieve a time averaged gravity vector of 10-2g, which is considered a useful paradigm for studying some aspects of microgravity. RCCS has become the most widely used ground-based model in studying the effects of microgravity on lymphocyte function. In this study, we evaluated the effects of different concentrations of lentinan and cordyceps sinensis on the splenic lymphocytes immune function in RCCS microgravity environment. We separated the splenic lymphocytes from mice, and cultured them into the normal gravity as well as the microgravity environments. The cells treated with different concentration of lentinan solution or cordyceps sinensis respectively. After incubated with polysaccharides for indicated hours(24h, 48h and 72h), the cells were harvested, analyzed for cell proliferation, as well as secretion of cytokine and the expression of cell surface markers. Our data indicated that, under simulated microgravity environment, the lymphocytes proliferation had been inhibited. Lentinan and cordyceps sinensis showed the different effects on enhancing lymphocytes' immunity when certain time. All concentration of lentinan had no effects on promoting lymphocyte proliferation, but they could increase the secretion of IL-2 and IFN- in microgravity environment, and also could enhance the expression of the lymphocyte surface markers, e.g CD4 and CD8. In particular, 40g/ml lentinan exhibited the best effect to against immunosuppression under RCCS simulated microgravity environment. As for cordyceps sinensis, when the concentration were 25g/ml and 50g/ml, the lymphocytes proliferation and CD4, CD8 expression all been increased, but along with the time away, 50g/ml cordyceps sinensis could inhibit the proliferation ability. Lentinan and cordyceps sinensis have the ability to enhance the lymphocytes' immune function in microgravity environment. These results would be valuable for screening drugs which can be potentially against immunosuppression in microgravity. Key words: Lentinan; Cordyceps Sinensis; Lymphocytes; Simulated Microgravity; Against Immunosuppression