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EXPLORING IGF-1 IN SPACE FOR MUSCLE AND IMMUNE HEALTH WITH NUTRITIONAL
STRATEGIES

Abstract

In the unique conditions of space, like microgravity, radiation, and temperature variations, the human body undergoes adaptive changes affecting various physiological systems. These adaptive changes will cause a lot of challenges such as bone loss, electrolyte imbalance, space sickness (nausea, headaches), gut microbiota disruption, muscle atrophy, increased level of inflammation, lower immunity and cardiovascular issues. While exercise and medical support can help combat some of these issues, addressing them during space travel demands specific nutritional solutions tailored to the challenges of in-flight adaptation. Specialized diets, supplements, and personalized nutrition plans play a crucial role in maintaining astronaut health and performance on extended space missions.

Muscle atrophy is one of the major challenges of space flight travel. Various hormones can help us overcome it naturally, and one of them is IGF-1. IGF-1 stands for insulin-like growth factor-1 and is secreted by the liver. Its primary role is cell growth and development, and is an important factor in erythropoiesis and bone marrow cell development. It is also involved in muscle building, growth, and repair. Apart from strengthening muscle, it causes bone resorption and formation and strengthens cartilage and ligaments. However high dose of IGF-1 should be kept in check since it can stimulate the growth of cells and inhibit cell death. Some studies have shown that IGF-1 will mitigate some space-flight induced effects on immune cells and its function. The main objective of this paper is to study IGF-1 effect on muscle building and strengthening and its potential role in immune system and to also look into the possibility of regulating it through food or supplements.