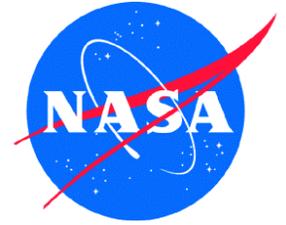


# NASA INFORMATION

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## Foot/Ground Reaction Forces

In space astronauts' bones become weak because they're not working against the Earth's gravity. Often they lose muscle at an accelerated rate, especially in the lower body. No walking is required as they float around, and they tend to use their arms as propellants.

Reduced workload causes muscles to decrease in size, strength and endurance. There are changes also in muscle protein composition. Researchers are trying to understand the hormonal and nutritional aspects of muscle change in weightlessness.

They are also developing pharmacological countermeasures and effective exercise regimens for astronauts. This will help scientists understand how skeletal muscle deficits are reflected in other organ systems.

The FOOT/Ground Reaction Forces during spaceflight experiment being conducted on the Space Station is measuring the forces on the lower limbs of astronauts during their regular workdays. Astronauts put on a Lower Extremity Monitoring Suit.

The customized garment is a pair of Lycra cycling tights that have 20 sensors. The LEMS will enable the electrical activity of muscles, the hip, knee, ankle joints, and the force under both feet to be measured continuously.

The FOOT experiment has the potential to shed new light on the reasons for bone and muscle loss during spaceflight. The intent is to find out if certain forms of exercise are more effective in decreasing the muscle loss.

The theories that are explored in this project have significance for understanding, preventing and treating osteoporosis on Earth, which is a major public health problem.