

# SOUTHWESTERN NEWS

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## **UT SOUTHWESTERN RECEIVES \$1.7 MILLION NASA GRANT TO STUDY EFFECTS OF LONG-TERM SPACE TRAVEL ON THE HEART**

DALLAS – Oct. 24, 2001 – Space researchers at UT Southwestern have received a \$1.7 million grant from the National Aeronautics and Space Administration to study why the heart decreases in size during long-term space travel.

Cardiac atrophy, or a decrease in heart mass, affects the heart's pumping ability and causes the heart to shrink and become stiff. This debilitating condition is also associated with orthostatic intolerance, or the inability to stand upright, and has been documented in short-term space flights.

"There has been some concern that if cardiac atrophy is severe then the risk of arrhythmias (abnormal heart rhythms) may increase," said Dr. Benjamin Levine, principal investigator on the study and medical director of the Institute for Exercise and Environmental Medicine, a collaboration between UT Southwestern and Presbyterian Hospital of Dallas.

"There has been at least one report of a life-threatening arrhythmia in one of the astronauts aboard the Russian Space Station Mir," he said. "Our goal is to clearly define the clinical manifestations of cardiac atrophy during long-duration space flight and obtain information that may provide insight into the risk for cardiac arrhythmias."

This condition may be a significant limiting factor for extended space missions, specifically the Mission to Mars, said Dr. Gunnar Blomqvist, professor of internal medicine and physiology and director of the NASA Specialized Center of Research and Training in Physiology at UT Southwestern from 1993 to 1998.

Before astronauts take off for the Mission to Mars, which is at least a 2½ year trip, researchers hope to identify measures that can be taken to reverse cardiac atrophy.

Levine recently completed a bed-rest study and found that exercise training while reclining prevented atrophy of the heart.

"We think that cardiac atrophy is reversible and potentially can be prevented with

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sufficient exercise," Levine said.

The researchers will study 12 astronaut crew members of the International Space Station before, during and after space missions ranging from three to six months. They will assess the changes in cardiac mass, the compliance of the heart and the heart's ability to relax using magnetic resonance imaging, echo-Doppler readings and catheter-based measures of central venous pressure.

Findings from the study will also be relevant for individuals confined to long-term bed rest, such as patients with spinal-cord injuries, and other conditions associated with cardiac stiffness, like congestive heart failure, ischemic heart disease and aging.

UT Southwestern space researchers have been awarded numerous competitive grants from NASA to study how the body adjusts and reacts to weightlessness.

Levine, associate professor of internal medicine, and Blomqvist's co-investigators at UT Southwestern include Dr. Jose Joglar, assistant professor of internal medicine and Dr. Richard Page, professor of internal medicine. They will be working with space-medicine investigators at UT Medical Branch in Galveston, the Cleveland Clinic and NASA's Johnson Space Center in Houston.

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