

SOUTHWESTERN NEWS

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TWO UT SOUTHWESTERN-TRAINED PAYLOAD SPECIALISTS TO STUDY THE NERVOUS SYSTEM ABOARD SPACE SHUTTLE COLUMBIA

DALLAS – April 15, 1998 – When the next flight of space shuttle Columbia goes into orbit April 16 on board will be two payload specialists who trained in space medicine at UT Southwestern Medical Center at Dallas. They will conduct experiments aboard Spacelab, the shuttle's scientific laboratory, on a flight dedicated to the study of the nervous system in space.

Dr. Jay Buckey worked as a research fellow with longtime space researcher Dr. Gunnar Blomqvist, the Alfred W. Harris Professor in Cardiology and director of NASA's Specialized Center of Research and Training in Integrated Physiology at UT Southwestern. Dr. Jim Pawelczyk was a research fellow with Dr. Benjamin Levine, associate professor of internal medicine and medical director of Presbyterian Hospital of Dallas' Institute for Exercise and Environmental Medicine (IEEM). Pawelczyk later was an investigator in the NASA center at UT Southwestern. Each joined the UT Southwestern faculty after completing his fellowship.

Another shuttle veteran, Dr. Drew Gaffney, was on the faculty of UT Southwestern while serving as a payload specialist aboard the first dedicated life-sciences flight in 1991.

"Training three scientists who became payload specialists for life-sciences research—that's a record no other medical center can claim," Blomqvist said.

As payload specialists, Buckey and Pawelczyk will be conducting experiments in space for a variety of researchers from around the world. Five major areas of research will be covered: blood pressure control and gravity; sensory motor and performance studies, such as eye-hand coordination and orientation in weightlessness; changes in the body's balance system; sleep problems in space; and the development of mammals in microgravity, including the formation of gravity sensors.

UT Southwestern's investigations, in which IEEM researchers play a crucial role, will

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focus on blood pressure control and how the cardiovascular system is stressed by gravity. This could lead to a better understanding of the type of blood-flow problems that cause an elderly person who stands up too quickly to become dizzy.

Blomqvist said astronauts leaving the pull of earth's gravity experience a similar blood-pressure problem when they enter space and return to earth. UT Southwestern researchers on previous missions—Spacelab Life Sciences 1, Spacelab Life Sciences 2 and Spacelab Mission Deutsche-1—gathered information on how the system adapts to space and readjusts to earth conditions. These studies revealed a defect in the autonomic nervous system apparent upon return to earth's gravity.

"These studies have broad application to medicine on earth as well as space," said Blomqvist, principal investigator of the blood-pressure studies. "Half a million people in the United States have trouble with control of blood pressure and blood flow to the brain while in the upright body position and might be helped by knowledge gained from these studies."

Other principal investigators for the blood-pressure experiment include Dr. F. J. Baisch of DLR Institute of Aerospace Medicine in Germany, Dr. D. L. Ekberg of Virginia Commonwealth University and Dr. Robertson of Vanderbilt University.

To conduct studies in anti-gravity, some research tools had to be adapted to the space environment. In order to conduct one experiment, Blomqvist and his associate Boyce Moon, a senior research scientist in internal medicine, modified a clinical method of testing blood pressure control. The simple test normally involves plunging a hand into ice water. To perform the test in space the two created a mitt filled with an icy gel. In another innovation Dr. Cole Giller, a consultant to the space lab and an assistant professor of neurological surgery, developed a Doppler ultrasound technique that will allow monitoring of the blood flow to the brain in space during a wide range of activities.

Buckey and Pawelczyk are on leave from their academic posts at other universities to work with NASA in Houston, where they have trained for the past two years.

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