

Dr. Mary Anne Frey

The Neurolab Spacelab Mission, which flew from April 17-May 3, 1998, was devoted to research on the nervous system. It was NASA's contribution to the 1990's Decade of the Brain. Neurolab provided a valuable transition from the Life Sciences research that had previously been completed on Spacelab to future research on the International Space Station.

One reason for this is the very close cooperation that was developed early in the planning stages of Neurolab with our Partners. Such cooperation will be essential for successfully conducting life sciences research on the International Space Station. The international partners on Neurolab included the European Space Agency (ESA), as well as the space agencies of Germany and France (DLR and CNES), the Japanese space agency (NASDA), and the Canadian Space Agency (CSA). These international partners provided important hardware, or equipment, that made some of the research on Neurolab possible. In addition, they supported the investigators and research from their countries. Neurolab principal investigators and co-investigators represented countries throughout the world. Our other partners on Neurolab were U.S. national partners: the National Institutes of Health, the National Science Foundation, and the Office of Naval Research. They helped make Neurolab possible by supporting the ground-based research of the U.S. investigators. In addition, the National Institutes of Health managed the international scientific peer review.

Furthermore, the experience gained on previous Spacelab missions enabled us to successfully fly a very sophisticated set of life sciences experiments on Neurolab. I will mention a few of the procedures and techniques that were performed in space flight for the first time on Neurolab. For the first time, we recorded directly from nerve cells of humans, that is, the crew members. We recorded from sympathetic nerves in their legs during, as well as before and after, space flight. We also directly recorded from the central nervous system of rats during the Neurolab space flight. And, we recorded from the vestibular nerve of fish. We performed surgery on animals with the animals recovering during the Neurolab flight. (This was required for one of the experiments, but it also provided knowledge that will help us prepare for the future possibility of surgery in space on humans.) Fetal mice were delivered during the flight for another research protocol. And, finally, the first in-space flight double-blind crossover study was conducted on Neurolab. This was an investigation of the efficacy of a low dose of melatonin to improve sleep and performance in space flight. Our next speaker will describe more about that study.

In fact, the Neurolab investigators are scheduled to report their preliminary results from the mission April 14 to 16, 1999, here at the National Academy of Sciences. You've had previews from some of the investigators already. Our next speaker was a co-investigator on another Neurolab investigation, and I'm pleased to have the opportunity to introduce him.

Dr. Rod Hughes received his Ph.D. in cognitive and behavioral neuroscience from Bowling Green State University in Ohio. While in Ohio, he studied the effects of melatonin on sleep, a topic related to his research on Neurolab. He conducted postdoctoral research at the Oregon Health Sciences University and became an Assistant Professor there. Later, he was Director of the Clinical Biology and Sleep Laboratory at Brooks Air Force Base for the U.S. Air Force. Dr. Hughes is now a faculty member at Harvard Medical

School, where he is a co-investigator on the Neurolab STS-90 sleep experiment, as well as on the sleep experiment that was performed on the STS-95 flight.

In closing, I would like to say that it has been an honor and a rewarding experience to be the Program Scientist for Neurolab. I have greatly enjoyed working with the investigators, with our partners, and with the many people in NASA whose diligent efforts made Neurolab such a successful mission.