Area of Research:
Neuroscience

NASA Program:
Biomedical Research and Countermeasures

NASA Field Center:
Johnson Space Center, Houston, Texas 77058

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NASA Research Laboratory:
Neurosciences Laboratory

Abstract:
The JSC Neurosciences Laboratories are engaged in a wide-ranging program of ground-based and space flight studies investigating the effects of unique space flight environmental variables, particularly microgravity, on the human nervous system. Results obtained from the Apollo, Skylab, Shuttle, Mir and ISS missions have focused our attention on studies that attempt to elucidate those neurosensory, sensorimotor, and related physiological mechanisms underlying space-adaptation syndrome (space motion-sickness, spatial disorientation, changes in neural motor function, vestibular driven cardiovascular function and perceptual illusions) and readaptation to Earth. Included are investigations of semicircular-canal and otolith-organ interaction processes, vestibulo-spinal reflex responses, visual-vestibular interaction processes, vestibular-autonomic interaction processes, eye-hand coordination, psycho-physiological responses, and postural and locomotion control processes.

Dr. Paloski’s research work is focused on sensorimotor adaptation, neuro-motor control, and the biomechanics of balance. His studies in this area include ground-based and space flight experimental evaluations of balance control performance, development of improved techniques for monitoring the mechanisms and consequences of balance control deficits, and development of mathematical models of balance adaptation and control. Dr. Paloski is also actively involved in studying the effects of centrifugation on humans and developing prescriptions for rotational artificial gravity as a multi-system countermeasure to the physiological deconditioning associated with space flight. Dr. Paloski is responsible for assessing the functional neurological status of crewmembers following space flight for the U.S. flight surgeons. In that context, he collaborates with his Russian counterparts from the Institute of Biomedical Problems in Moscow on standardization of assessment techniques, and he collaborates with clinical experts on developing risk assessment and abatement strategies.

Dr. Paloski is willing to take on postdoctoral fellows interested in working in one or more of these areas and having backgrounds in motor control, biomechanics, kinesiology, physiology, neurosciences, engineering, mathematical modeling, or epidemiology.