



# NSBRI Explorer

National Space Biomedical Research Institute • April 2006

## Successful NASA Five-Year Review

Howard Zucker, M.D., J.D., chaired the committee performing a comprehensive Five-Year Review of NSBRI in December. The review was favorable, and the committee was impressed with the overall quality of NSBRI's scientific, education and management components. The report stated that "NSBRI is attracting some of the best biomedical researchers in the United States and that the researcher teams had made fine progress towards performing projects that are focused on producing deliverable countermeasures to NASA." An interactive demonstration of NSBRI science, technology and educational initiatives, facilitated by NSBRI Principal Investigators, Team Leaders and Associate Team Leaders, was the highlight of the review. Forty-seven people, including Postdoctoral Fellows and previous Summer Interns, participated in the event, sharing their enthusiasm for the Institute's program to pave the way for human exploration of space. The panel report provided six key recommendations including the recommendation that NASA continue the NSBRI into a third, five-year period of funding. NASA and NSBRI will work together to achieve the recommendations. ♦

## NSBRI Behavioral Health Feasibility Study "Splashes Down" with NEEMO 9

This month, an NSBRI behavioral health study was conducted during a space analog mission at 20 meters under the sea. Led by NSBRI's David F. Dinges, Ph.D., Neurobehavioral and Psychosocial Factors Team Leader (University of Pennsylvania School of Medicine), the study aims to determine the technical feasibility of conducting a suite of five experiments to measure individual readiness and teamwork performance.

The measurements were taken during tasks designated for crew participants on the NEEMO (NASA Extreme Environment Mission Operations) 9 mission conducted in the National Oceanographic and Atmospheric Administration's Aquarius underwater habitat in the Florida Keys, April 3-20. For additional mission information, see the related [news release](#). ♦

## Retreat Covers Exploration Priorities

The Investigator Retreat held February 27-March 1 at South Shore Harbour brought together many groups focused on achieving the Vision for Space Exploration. Attendees included NSBRI investigators, NASA scientists and space medicine representatives, members of the astronaut corps, NASA contractors, industry partners and international colleagues. The attendance clearly reflected the partnership between NSBRI and NASA as the organizations work to realign programs to meet the space program's needs given changing priorities and budget constraints.

In addition to presentations from all NSBRI science, technology and education teams, a NASA panel detailed projects of the newly-developed JSC Human Research Program Office. Special lectures included presentations by Carl Walz of NASA Headquarters' Advanced Capabilities Division, Jeffrey Davis, M.D., and Kathy Laurini of NASA Johnson Space Center's Space Life Sciences Directorate, Leroy Chiao, Ph.D., former astronaut and Chair of the NSBRI User Panel, and Inessa Kozlovskaya, M.D., Ph.D., D.Sc., distinguished guest from the Institute of Biomedical Problems, Russia.

The retreat concluded with two panels, one highlighting interactions between NSBRI, government and industry as they relate to priorities for human space exploration, and the other featuring an astronaut and flight surgeon panel addressing countermeasure development specifically tailored to the NASA customer needs. ♦

## Postdoctoral Fellowships Awarded

Three Postdoctoral Fellows were selected for 2005-2007. The two-year program offers Fellows the opportunity to manage their own space-related biomedical research project while continuing to learn from an experienced faculty mentor. At the NSBRI Investigator Retreat, the Fellows were able to meet with other members of their specific NSBRI research teams. In addition, Fellows attended a special workshop on interviewing skills. Sonia Rahmati Clayton, Ph.D., (Baylor College of Medicine) manages the fellowship program. ♦

## Ultrasound Training Program Tested at Olympics

Ultrasound training methods developed by Scott Dulchavsky, M.D., Ph.D., Smart Medical Systems Team (Henry Ford Hospital), got a test run at the Winter Olympics in Turin, Italy. The U.S. Women's Hockey Team partnered with Dulchavsky to evaluate the training method. Baseline ultrasound scans were obtained prior to the Olympics in an effort to provide faster assessment of injuries occurring at the games.

Dulchavsky's NSBRI project is designed to teach non-physician astronauts how to use portable ultrasound to help diagnose injuries. In addition to the U.S. Hockey Team, trainers for the Detroit Red Wings have received the training designed for astronauts.

Rapid, point-of-care diagnosis during athletic events is just one of the project's Earth applications. He is investigating video streaming technology, which could extend use of this technology to ambulances, accident scenes and remote areas, including military locations. Onsite assessment would allow emergency care decisions, such as transport to local hospitals versus trauma centers, to be made with greater certainty. ♦

## Recent Publications

Guida, P., M. E. Vazquez, and S. Otto. Cytotoxic effects of low- and high-LET radiation on human neuronal progenitor cells: induction of apoptosis and TP53 gene expression. *Radiat Res* 164(4):545-51, 2005. (Cross-Cutting Radiation Efforts) ♦

Haddad, F., G. R. Adams, P. W. Bodell, and K. M. Baldwin. Isometric resistance exercise fails to counteract skeletal muscle atrophy processes during the initial stages of unloading. *J Appl Physiol* 100(2):433-41, 2006. (Muscle Alterations and Atrophy Team) ♦

Hochstadt, J., H. Nakano, P. Lieberman, and J. Friedman. The roles of sequencing and verbal working memory in sentence comprehension deficits in Parkinson's disease. *Brain Lang* 2005 Dec 2 [Epub ahead of print] (Neurobehavioral and Psychosocial Factors Team) ♦

Lin, W., E. Mittra, and Y. X. Qin. Determination of ultrasound phase velocity in trabecular bone using time dependent phase tracking technique. *J Biomech Eng* 128(1):24-9, 2006. (Technology Development Team) ♦

Lockley, S. W., E. E. Evans, F. A. Scheer, G. C. Brainard, C. A. Czeisler, and D. Aeschbach. Short-wavelength sensitivity for the direct effects of light on alertness, vigilance, and the waking electroencephalogram in humans. *Sleep* 29(2):161-8, 2006. (Human Performance Factors, Sleep and Chronobiology Team) ♦

Rabin, E., P. Dizio, and J. R. Lackner. Time course of haptic stabilization of posture. *Exp Brain Res* 170(1):122-6, 2006. (Sensorimotor Adaptation Team) ♦

Rahman, M. A., A. Gedevarishvili, Y. Birnbaum, L. Sarmiento, W. Sattam, W. B. Kulecz, and T. T. Schlegel. High-frequency QRS electrocardiogram predicts perfusion defects during myocardial perfusion imaging. *J Electrocardiol* 39(1):73-81, 2006. (Education and Outreach: Summer Intern Program) ♦

Steppan, J., S. Ryoo, K. H. Schuleri, C. Gregg, R. K. Hasan, A. R. White, L. J. Bugaj, M. Khan, L. Santhanam, D. Nyhan, A. A. Shoukas, J. M. Hare, and D. E. Berkowitz. Arginase modulates myocardial contractility by a nitric oxide synthase 1-dependent mechanism. *Proc Natl Acad Sci U S A* 103(12):4759-64, 2006. (Cardiovascular Alterations Team) ♦

Wertz, A. T., K. P. Wright Jr., J. M. Ronda, and C. A. Czeisler. Effects of sleep inertia on cognition. *JAMA* 295(2):163-4, 2006. (Human Performance Factors, Sleep and Chronobiology Team) ♦

## Accolades

**Clifford W. Houston, Ph.D.**, Education and Outreach Team Member (University of Texas Medical Branch), has been elected President-elect of the American Society for Microbiology effective July 1. Houston will be the first African American to head the 42,000 member scientific organization. ♦

**William A. Thomson, Ph.D.**, Education Program Leader (Baylor College of Medicine), was awarded the 2005 Outstanding Alumni Award from the College of Education and Human Development at Texas A&M University. ♦

## Calendar Update

NSBRI Board of Directors Meeting  
September 21, Houston