NSBRI Explorer

National Space Biomedical Research Institute • December 2006

User Panel Gets "Hands-On" Experience with NSBRI Projects

The Institute's User Panel convened in mid October for a meeting that included a showcase of four NSBRI projects. Chaired by Leroy Chiao, Ph.D., Commander and Science Officer of International Space Station Expedition 10, and Jonathan Clark, M.D., NSBRI/NASA Space Medicine Liaison, the meeting engaged the user community through NSBRI investigator demonstrations of promising countermeasures and technologies. Panel members include former and current astronauts and NASA flight surgeons.

The group appreciated the opportunity to give feedback on the various projects' operational feasibility as well as operational need. A key outcome of the meeting was the decision for the User Panel to look at the entire NSBRI product pipeline. As the Institute matures, input from the astronaut and flight surgeon community is critical for NSBRI's research, development, testing and evaluation efforts with NASA.♦

Workshop Addresses Radiation Countermeasure Needs

In late October, NSBRI/NASA Space Radiation Liaison, Marcelo Vazquez, M.D., Ph.D., and NSBRI Radiation Effects Team Leader, Ann Kennedy, D.Sc., (University of Pennsylvania School of Medicine) organized an NSBRI Medical Radiation Counter-measures Workshop. The meeting brought together key researchers and NASA astronauts, flight surgeons and project managers and engaged many outstanding radiation experts from both science and medicine. The agenda focused on current medical practices for acute and late effects in humans exposed to radiation.

Discussions centered on the importance of studies in radiation countermeasures for space exploration. The ideas and feedback from the meeting will be critical in helping NSBRI and its NASA partner shape the strategic plan and research priorities related to countermeasures addressing the health risks associated with radiation.

The workshop abstracts, presentations and report will be accessible from the Radiation Effects Team Page on the NSBRI website in mid December.♦

U.S./Russian Joint Working Group Meets

For the second year, NSBRI participated in the U.S./Russian Joint Working Group on Space Biomedicine, Life Support Systems and Microgravity Sciences. Last year, Jeanne L. Becker, Ph.D., NSBRI Associate Director, and this year, Jeffrey P. Sutton, M.D., Ph.D., NSBRI Director, represented the Institute at the meeting held at the Institute for Biomedical Problems in Moscow. The group heard status reports from both delegations concerning space biology and space medicine. Presentations emphasized International Space Station research and opportunities for collaboration.

Participants also discussed the importance of education and outreach in inspiring the next generation of scientists and physicians who will work in the human spaceflight arena. Sutton delivered a briefing on the role NSBRI plays in education and outreach efforts and the opportunities for international participation and collaboration in education as well as science and technology.

NSBRI recognizes the importance of international activities in meeting its research and education mission.♦

Postdoctoral Fellowships Awarded as First Fellows Complete Program

NSBRI awarded three Postdoctoral Fellowships for 2006-2008. The Fellows, Roger K. Long, M.D., Ph.D., Paul MacNeilage, Ph.D., and Shigeki Shibata, M.D., Ph.D., are the third group selected since NSBRI initiated the program in 2004. (List of Fellows and Project Summaries)

The 2004-2006 inaugural class of Fellows completed the program in October. They have accepted positions at the following universities and research institutes:

- Sophie Gaboyard, Ph.D. – Research Contractor, Institute of Neurosciences, Montpellier, France
- Andrew Judge, Ph.D. – Research Associate Scientist, University of Florida
- Luis Cardoso Landa, Ph.D. – Assistant Professor, City College of New York
- Vesna Zderic, Ph.D. – Assistant Professor, George Washington University.♦

Ansari Luncheon Inspires Exploration and Education

Anousheh Ansari, entrepreneur and recent spaceflight participant, spoke at a special Baylor College of Medicine (BCM) luncheon in November hosted by BCM Board Member Ali Saberioon and his wife Gita. The event drew a capacity crowd of nearly 100. In September, Ansari became the first female private space explorer and the first astronaut of Iranian descent. Her flight included eight days on the International Space Station.

Sharing videos of her training and flight, Ansari spoke enthusiastically of space exploration and the need to encourage children to pursue science and math education. Activities during her flight included space-to-ground presentations given to schools across the world, including students in Iran.

NSBRI collaborated with BCM for the luncheon. Attendees had the opportunity to visit a number of exhibits and demonstrations of medical technologies and training methods being developed through NSBRI and learned about the Institute's education and outreach program which engages the next generation of space life scientists.♦

Recent Publications

Garma, T. M., C. A. Kobayashi, F. Haddad, G. R. Adams, P. W. Bodell, and K. M. Baldwin. Similar acute molecular responses to equivalent volumes of isometric, lengthening or shortening mode resistance exercise. *J Appl Physiol* 2006 Sep 28 [Epub] (Muscle Alterations and Atrophy Team)♦

Hamilton, S. A., M. J. Pecaut, D. S. Gridley, N. D. Travis, E. R. Bandstra, J. S. Willey, G. Nelson, and T. A. Bateman. A murine model for bone loss from therapeutic and space-relevant sources of radiation. *J Appl Physiol* 101:789-793, 2006. (Bone Loss Team)♦

Hurley, K. M., S. Gaboyard, M. Zhong, S. D. Price, J. R. Wooltorton, A. Lysakowski, and R. A. Eatock. M-like K^+ currents in type I hair cells and calyx afferent endings of the developing rat utricle. *J Neurosci* 26(40):10253-69, 2006. (Postdoctoral Fellow – Sensorimotor Adaptation Team)♦

Gashev, A. A., M. D. Delp, and D. C. Zawieja. Inhibition of the active lymph pump by simulated microgravity in rats. *Am J Physiol Heart Circ Physiol* 290(6):H2295-308, 2006. (Cardiovascular Alterations Team)♦

Jasser, S. A., J. P. Hanifin, M. D. Rollag, and G. C. Brainard. Dim light adaptation attenuates acute melatonin suppression in humans. *J Biol Rhythms* 21(5):394-404, 2006. (Human Performance Factors, Sleep and Chronobiology Team)♦

Luo, W., V. Zderic, S. Carter, L., and S. Vaezy. Detection of bleeding in injured femoral arteries with contrast-enhanced sonography. *J Ultrasound Med* 25:1169-1177, 2006. (Postdoctoral Fellow – Smart Medical Systems Team)♦

Mittra, E., S. Akella, and Y. X. Qin. The effects of embedding material, loading rate and magnitude, and penetration depth in nanoindentation of trabecular bone. *J Biomed Mater Res A* 79(1):86-93, 2006. (Technology Development Team)♦

Moore, S. T., H. G. MacDougall, B. T. Peters, J. J. Bloomberg, I. S. Curthoys, and H. S. Cohen. Modeling locomotor dysfunction following spaceflight with Galvanic vestibular stimulation. *Exp Brain Res* 174(4):647-59, 2006. (Sensorimotor Adaptation Team)♦

Moreno, N., and B. Tharp. How do students learn science? In Rhoton, J., and P. Shane (eds.), *Teaching Science in the 21st Century*. Arlington, VA: NSTA Press, 292–305, 2006. (Education and Outreach Team)♦

Paddon-Jones, D. Interplay of stress and physical inactivity on muscle loss: Nutritional countermeasures. *J Nutr* 136(8):2123-6. 2006. (Nutrition, Physical Fitness and Rehabilitation Team)♦

Zhou, G., P. V. Bennett, N. C. Cutter, and B. M. Sutherland. Proton-HZE-particle sequential dual-beam exposures increase anchorage-independent growth frequencies in primary human fibroblasts. *Radiat Res* 166(3):488-94, 2006. (Radiation Effects Team)♦

Calendar Update

NASA Human Research Program/
NSBRI Investigator Workshop
February 11-14, 2007
NSBRI Principal Investigators attend
South Shore Harbour Conference Center
League City, Texas♦