



NSBRI Explorer

National Space Biomedical Research Institute • August 2008

In Memoriam: Michael E. DeBakey, M.D. **Sept. 7, 1908 – July 11, 2008**

Educator. Surgeon. Inventor. Medical Statesman. Michael E. DeBakey, M.D., a founding member of NSBRI's Board of Directors, has been called the 20th century's greatest surgeon. He was an enthusiastic supporter of NSBRI and its mission, rarely missing a Board meeting. NSBRI mourns the loss of this great visionary but takes pride in the countless innovations he brought to medical care. His wisdom and counsel will be missed.

"Dr. DeBakey was a valiant surgeon; he took risks that others might not take in order to advance medicine and to save the lives of his patients," said Bobby R. Alford, M.D., NSBRI Chairman and CEO. "He had impeccable judgment throughout his career. He was a most scholarly individual, always looking for evidence to support the outcomes of the surgery, and he reflected that in all that he did."

Dr. Alford, whose relationship with Dr. DeBakey spanned 50 years, delivered remarks at the memorial service July 16. "In 1955, I was very privileged and fortunate to have been invited by Dr. DeBakey to work in his research laboratories the summer between my junior and senior year in medical school which was at the dawn of cardiac and vascular surgery as we know it today," Alford said. "Regrettably, I can never repay him for the many kindnesses and considerations he extended to me as a student, resident, and faculty member; nor for all of the things he taught me."

The world lost a brilliant man, but his many contributions will continue to save lives for years to come. ([Website Honoring Dr. DeBakey](#)) ♦

NASA/NSBRI Joint Solicitation

On Aug. 6, NASA and NSBRI released a joint solicitation, NNJ08ZSA002N, "Research and Technology Development to Support Crew Health and Performance in Space Exploration Missions." The announcement solicits ground-based, bed-rest definition and flight definition proposals for the Human Research Program and NSBRI. Proposals are solicited through a two-step process. Only Step-1 proposers determined to be relevant to the solicited research will be invited to submit full Step-2 proposals. Step-1 proposals are due Sept. 5. ([Joint Solicitation](#)) ♦

International Partnerships: 105-Day Isolation Study

In preparation for six-person International Space Station (ISS) crews, a 105-day isolation study in Russia will gather data on crew health and performance. NSBRI and the Institute for Biomedical Problems (IBMP) in Moscow have initiated an international agreement opening new opportunities for collaborative research among spacefaring nations. NSBRI will manage the 105-day study's U.S. science participation. The European Space Agency is also participating in the study.

Scheduled for early 2009, the study will involve an international six-person crew staying 105 days in IBMP's Medical-Engineering Facility. The facility's five interconnected, self-contained modules have medical and scientific research areas, sleeping quarters, a kitchen and exercise facility.

NSBRI's three studies will address behavioral health, evaluate lighting countermeasures, and assess interactions between crew members and with "mission control." ♦

NSBRI and ISS National Lab Utilization

Through Congressional testimony, industry partnerships, and its research pipeline, NSBRI is focusing on use of the ISS National Laboratory. On April 24, Jeffrey P. Sutton, M.D., Ph.D., NSBRI Director, testified before the Subcommittee on Space and Aeronautics of the U.S. House of Representatives Committee on Science and Technology. The hearing addressed NASA's ISS Program: Status and Issues. ([Testimony](#)) "The ISS is a precious resource," Sutton said. "The National Laboratory opens new paths for federal agencies, academia and industry to do science that has impact for the nation."

Jeanne L. Becker, Ph.D., NSBRI Associate Director, is involved in such a partnership. In her role as Chief Science Officer of BioSpace Technologies Inc., this group has engaged scientists from several universities and, in partnership with Space Florida, has conducted two studies focused on *Salmonella* vaccine development using microgravity-enhanced bacterial virulence to identify vaccine targets.

NSBRI is also emphasizing the movement of technologies in its pipeline to microgravity flights in preparation for ISS deployment. ♦

Interns Use Summer to Gain Space Research Experience

Instead of taking it easy during their summer break, 15 undergraduate and graduate students are honing their research skills through the NSBRI Summer Internship Program at NASA Johnson Space Center (JSC).

Applications increased by 46 percent from the prior year. Open to undergraduate, graduate or medical students, the 10-15 week program pairs students with JSC mentors. This year's interns are working on projects assessing muscle performance and changes in lean body mass, balance and orientation disturbances during and after gravitational changes, the effects of radiation on bone, and software for enhanced analysis of the heart's electrical activity. ([List of Interns](#))

"I am intrigued by the widespread applications of space research to medical research on Earth and am excited to be immersed in a culture characterized by focus, passion and innovation," said Teresa Ai, a junior at Duke University, interning in the JSC Bone Laboratory with Jean Sibonga, Ph.D.

The students are highly sought after by the JSC mentors.

"I've been an NSBRI mentor since the program began and have mentored more than a dozen students. They are always highly motivated and capable and have made important contributions to our research," said Todd Schlegel, M.D., of JSC's Neuroautonomic Laboratory.

Discussions are under way to expand to a truly national program by offering internship opportunities at several NASA Centers, including JSC. ♦

Recent Publications

Bandstra ER, Pecaut MJ, Anderson ER, Willey JS, De Carlo F, Stock SR, Gridley DS, Nelson GA, Levine HG, Bateman TA. Long-term dose response of trabecular bone in mice to proton radiation. *Radiat Res.* 2008 Jun;169(6):607-14. (Musculoskeletal Alterations Team) ♦

Chee MW, Tan JC, Zheng H, Parimal S, Weissman DH, Zagorodnov V, Dinges DF. Lapsing during sleep deprivation is associated with distributed changes in brain activation. *J Neurosci.* 2008 May 21;28(21):5519-28. (Human Factors and Performance Team) ♦

Crim KC, Sanders LM, Hong MY, Taddeo S, Turner ND, Chapkin RS, Lupton JR. Upregulation of p21Waf1/Cip1 expression in vivo by butyrate

administration can be chemoprotective or chemopromotive depending on the lipid component of the diet. *Carcinogenesis.* 2008 Jul;29(7):1415-20. (Human Factors and Performance Team) ♦

Dorfman TA, Rosen BD, Perhonen MA, Tillery T, McColl R, Peshock RM, Levine BD. Diastolic suction is impaired by bed rest: MRI tagging studies of diastolic untwisting. *J Appl Physiol.* 2008 Apr;104(4):1037-44. (Cardiovascular Alterations Team) ♦

Firestein R, Blander G, Michan S, Oberdoerffer P, Ogino S, Campbell J, Bhimavarapu A, Luikenhuis S, de Cabo R, Fuchs C, Hahn WC, Guarente LP, Sinclair DA. The SIRT1 deacetylase suppresses intestinal tumorigenesis and colon cancer growth. *PLoS ONE.* 2008 Apr 16;3(4):e2020. (Postdoctoral Fellow – Radiation Effects Team) ♦

Elias PZ, Jarchow T, Young LR. Incremental adaptation to yaw head turns during 30 RPM centrifugation. *Exp Brain Res.* 2008 Aug;189(3):269-77. (Sensorimotor Adaptation Team) ♦

Kennedy AR, Davis JG, Carlton W, Ware JH. Effects of dietary antioxidant supplementation on the development of malignant lymphoma and other neoplastic lesions in mice exposed to proton or iron-ion radiation. *Radiat Res.* 2008 Jun;169(6):615-25. (Radiation Effects Team) ♦

Soller BR, Yang Y, Lee S, Wilson C, Hagan RD. Noninvasive determination of exercise-induced hydrogen ion threshold through direct optical measurement. *J Appl Physiol.* 2008 Mar;104(3):837-44. (Smart Medical Systems and Technology Team) ♦

Zheng S, Liu M, Tai YC. Micro Coulter counters with platinum black electroplated electrodes for human blood cell sensing. *Biomed Microdevices.* 2008 Apr;10(2):221-31. (Smart Medical Systems and Technology Team) ♦

Calendar Update

NSBRI Board of Directors Meeting
September 18, Houston

NSBRI User Panel Meeting
September 24, Houston

NSBRI External Advisory Council Meeting
September 25, Houston ♦

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