NEWSBRIEFS

NCI to Accelerate Research

On April 20 at the American Association for Cancer Research 100th Annual Meeting in Denver, CO, National Cancer Institute (NCI) Director John E. Niederhuber, MD, announced details of plans to "move cancer research forward in this new economic environment." The plan focuses on funding more research, advancing personalized cancer care, and accelerating cancer genetics initiatives. "We must hasten our progress against cancer by conducting exciting new science, which this year's increase in funding, in addition to anticipated funds from the American Recovery and Reinvestment Act [ARRA], will help make possible," said Niederhuber. "Because cancer research contributes to the diagnosis and treatment of many other major diseases, we anticipate NCI's efforts will lead to scientific advances necessary to improve the nation's health." NCI received a nearly 3% funding increase in the latest federal budget.

Among plans outlined by Niederhuber to strengthen cancer research are: (1) an increase in the NCI payline to fund a greater number of meritorious investigator-initiated projects (The payline is the funding cutoff point for grant applications that is set at the beginning of each fiscal year. This year's budget increase will take NCI's payline from the 12th percentile to the 16th percentile, with further increases to the 25th percentile likely for 2-y and longer-term grants.); (2) more grants to first-time investigators; (3) help to universities for assisting and training new faculty investigators; (4) development of a personalized cancer care platform to enable drug development and to facilitate the translation of investigations from discovery of genetic changes to clinical applications for patients; (5) a network of physical sciences–oncology centers to explore

new and innovative approaches to better understanding and controlling cancer through convergence of the physical sciences with cancer biology; and (6) expansion of the Cancer Genome Atlas, designed to accelerate understanding of the molecular basis of cancer through application of high-throughput genome analysis technologies that interrogate genomes of statistically significant numbers of high-quality human cancer biospecimens.

Many of these NCI initiatives will include molecular imaging as an integral component of diagnosis, prognosis, monitoring, and assessment. Niederhuber's speech can be read at: www.cancer.gov/newscenter/pressreleases/AACRspeech2009QandA. More information on the NCI ARRA initiatives is available at: www.cancer.gov/recovery.

National Cancer Institute

NIH Center for Interventional Oncology

The National Institutes of Health (NIH) on April 22 released information on its new Center for Interventional Oncology established at the NIH Clinical Center in Bethesda, MD. The new center is a collaborative effort of the Clinical Center, the National Cancer Institute (NCI), and the National Heart, Lung, and Blood Institute (NHLBI). It offers new and expanded opportunities to investigate cancer therapies that use imaging technology to diagnose and treat localized cancers in ways that are precisely targeted and non- or minimally invasive.

Bradford Wood, MD, a Clinical Center senior investigator, is chief of the new center. "The Center for Interventional Oncology will help foster advances in an emerging field for minimally invasive, image-guided methods for treating localized cancers," he said. "It will also help bridge the gap between emerging technology and the everyday practice of medicine. Advanced imaging methods have ushered in an era of early detection of cancers that are frequently localized to a single organ. Today, oncology treatments typically use systemic therapies such as chemotherapy, surgery, and radiation, which are well suited for widespread disease but may also cause widespread side effects."

The new center is intended to provide a forum for and encourage collaborations among research and patient-care experts in medical, surgical, and radiation oncology as well as interventional radiology. The center's goal is localized treatment and drug delivery by use of advanced imaging technologies located at the Clinical Center, including cutting-edge MR, PET, and CT imaging, combined with the capability to use all 3 technologies alone or in combination to guide therapeutic devices.

Among the localized therapies to be investigated is tumor ablation with energy sources including high-intensity focused ultrasound, freezing, microwaves, and radiofrequency. Researchers will also expand investigations into electroporation, the use of electricity to make cells more open to targeted drug delivery. Image-guided drug delivery investigations are planned, with research focused on combining nanoparticles, ablative devices, and advanced imaging and navigation.

Educational and training opportunities are part of the program. "Many oncologists are not currently familiar with, nor trained in, image-based, localized treatment approaches from which many patients may benefit. Conversely, interventional radiologists lack formal training in oncology," Wood said. "This new program is ideally and uniquely positioned to provide an interdisciplinary environment combining training, patient treatment, and translational research and development in interventional oncology."

David Bluemke, MD, PhD, director of NIH Clinical Center Radiology and Imaging Sciences, will head the Center for Interventional Oncology steering committee, including 2 NCI appointees and 1 each from NHLBI and the Clinical Center.

National Institutes of Health

Local Hospital Disaster Preparedness

U.S. hospitals are significantly better prepared for disasters and public health emergencies now than in 2001, but much work remains to be done, according to a University of Pittsburgh Medical Center (UPMC) study. The study was released on April 23 by the U.S. Department of Health and Human Services (HHS) Office of the Assistant Secretary for Preparedness and Response. The UPMC group conducted an independent evaluation of the HHS Hospital Preparedness Program (HPP) and the program's impact on health care preparedness for mass casualty disasters. The program was established by the Pandemic and All-Hazards Preparedness Act of 2006 to improve readiness for all types of disasters.

"Hospitals are the foundation of the local health care response to man-made and natural disasters. Each community's success in responding and recovering depends in no small part on how well prepared the local hospital is to withstand and respond to disaster," said W. Craig Vanderwagen, MD, HHS assistant secretary for preparedness and response and a rear admiral in the U.S. Public Health Service. "The HHS HPP has continually worked with states and local communities to bolster that planning and response capability across the country."

The study evaluated the first 5 y of the program from 2002 to 2007, including interviews with 133 individuals involved with hospital preparedness in every state and at local levels across the country. The researchers found that the most useful indicators for measuring the preparedness of hospitals are ability to "surge" to accommodate additional patients during disasters, how well hospitals train their staffs for disasters and realistic exercises, and how well hospitals perform during actual disasters. Hospital senior leaders now actively support and participate in preparedness activities, hospital emergency operations plans are more comprehensive and better coordinated with community emergency plans and local hazards, and

disaster training has become more rigorous, the report said. Hospitals have also stockpiled emergency supplies and medicines, improved communication systems, and conducted more frequent and higher quality disaster exercises than in the past.

The study showed that HPP has been a catalyst for new health care coalitions throughout the country. As a result, it said, many communities can now respond more effectively to disasters. Through these coalitions, hospitals now work collaboratively on disaster preparedness with other hospitals, public health departments, and emergency managers. The report noted, however, that health care planning for catastrophic emergencies at the individual hospital level is still in the early stages and that a large-scale emergency could "overwhelm the medical capabilities of communities, regions or the entire country and require drastic departures from customary health care practices." The report concluded that bridging this gap would require significant changes in the ways in which health care is delivered.

The full report is available at www.upmc-biosecurity.org/HPPreport.

U.S. Department of Health and Human Services

Space Station Research Opportunities

The National Institutes of Health (NIH) and the National Air and Space Administration (NASA) announced on April 8 a partnership to solicit proposals for biomedical experiments that astronauts could perform on the International Space Station. In a notice to scientists at universities, medical centers, and companies across the United States, the NIH noted its intention to fund highly meritorious biomedical experiments that could utilize the unique environment in space and produce breakthroughs to improve human health on Earth.

The International Space Station provides a special microgravity and radiologic environment that Earth-based laboratories cannot replicate. The U.S. Congress, recognizing the promise the facility holds for American-led science

and technology efforts, opened the U.S. portion of the International Space Station to other federal agencies and university and private sector researchers when it designated the U.S. resources as a National Laboratory in 2005.

The NIH solicitation is the next step in a new partnership to apply this national laboratory to research that complements NASA's space exploration efforts. Biomedical experiments conducted on the International Space Station have already addressed the ways in which bone and muscle deteriorate, how humans fight infectious disease, and how cancers grow and spread. "The ISS is an extraordinarily capable laboratory in a unique environment that has not previously been available for widespread medical research. NASA strongly supports the NIH's leadership in this promising opportunity," said Mark Uhran, NASA's assistant associate administrator for the International Space Station.

The NIH–NASA program will encourage a new cadre of health researchers from a variety of disciplines to incorporate the space environment into their experiments and will support them as they prepare their experiments for launch and analyze their data following a mission. The press release accompanying the announcement especially encouraged biomedical researchers working in molecular or cellular biology, biomaterials, or telemedicine "to give serious thought to how International Space Station facilities might answer their most pressing questions about how to benefit life on Earth."

Among the NIH sponsors of this initiative are the National Institute of Biomedical Imaging and Bioengineering; National Cancer Institute; National Institute of Arthritis and Musculoskeletal and Skin Diseases; National Center for Research Resources; National Heart, Lung, and Blood Institute; National Institute on Aging; National Institute on Alcohol Abuse and Alcoholism; National Institute of Child Health and Human Development; and National Institute of Neurological Disorders and Stroke.

The full UH2/UH3 funding announcement is available at: http://grants.nih.gov/grants/guide/pa-files/PAR-09-120.html. Letters of intent are due on August 31, with submission deadlines in September. A preapplication meeting will be held on June 16 in Houston, TX (http://grants1.nih.gov/grants/guide/notice-files/NOT-AR-10-020.html).

National Institutes of Health
National Air and Space Administration

NIH Advisory Committee to the Director

The National Institutes of Health announced on April 3 the selection of 3 individuals to serve as members of the Advisory Committee to the Director (ACD), which provides guidance on policy and planning issues important to the NIH mission of conducting and supporting biomedical and behavioral research, research training, and translating research results for the public. "These new members to the NIH Advisory Committee to the Director will bring an even greater depth and range of expertise to this dedicated team of advisors," said Acting NIH Director Raynard S. Kington, MD, PhD.

The new members of the council are Maria Freire, PhD, president of the Albert and Mary Lasker Foundation (New York, NY); Beatriz Luna, PhD, an associate professor of psychiatry and psychology at the University of Pittsburgh (PA); and James Thrall, MD, Juan M. Taveras Professor of Radiology at Harvard Medical School and radiologist-in-chief of the Massachusetts General Hospital (Boston). Thrall is internationally known for his work in nuclear medicine and for his development of research programs in radiology. He has served on the boards of several national organizations devoted to radiology and currently serves as chair of the Board of Chancellors of the American College of Radiology and secretary of the Academy of Radiology Research. He is a past president of the American Roentgen Ray Society.

Additional information about the ACD is available at http://acd.od.nih.gov/.

National Institutes of Health

SNM Clinical Trials Network Phantom Program

The SNM Clinical Trials Network announced on April 14 that a prototype clinical PET oncology imaging phantom had been successfully scanned and imaged at 4 imaging centers. SNM intends to deliver and scan the phantom at an additional 20 imaging centers by the end of September. The SNM Clinical Trials Network, as part of a mission to ensure standardization and harmonization across multiple imaging sites participating in clinical trials, evaluates images produced by phantoms to ensure that molecular imaging centers are providing consistent and accurate images. Imaging consistency among sites, both in the technology used and images produced, is critical for ensuring quality imaging and quantitative data and is essential to meet U.S. Food and Drug Administration (FDA) requirements for investigational clinical trials.

"The community agrees that a lack of uniformity across imaging sites is a primary barrier to using imaging in clinical trials to facilitate drug development," said Michael Graham, PhD, MD, cochair of SNM's Clinical Trials Network. "When pharmaceutical companies apply to FDA for approval of a new product, they must first demonstrate a certain level of disease detectability as evidenced by some imaging measurement. Many of the denials of new drugs are based on a rejection of data compiled from poor-quality images or images that don't appear to match those from another similar study."

Successful phantom scanning is a part of the overall process that the network will use to validate imaging sites for future clinical trials. Imaging of the PET phantoms will be used to qualitatively and quantitatively evaluate each site's imaging capabilities and ensure standardization and compliance with defined protocols for consistency across multiple centers in a single trial.

"The network's phantom program draws upon an SNM phantom imaging program that has been operational for

over 10 years. In addition, SNM maintains a group of experts who evaluate a center's image quality," said Paul E. Christian, chair of the Clinical Trials Network's Phantom Subcommittee. "Based on these phantom images, experts can help imaging centers by recommending adjustments in the image acquisition parameters to produce images of a very high quality."

The first phantom in use is the oncology phantom (designed primarily to support investigational oncology clinical trials), which was scanned at each of 4 test sites—the University of Utah, University of Iowa, University of Pennsylvania, and Mayo Clinic—using a standard imaging protocol. To test the resolution of the imaging equipment at each site, the phantom contained multiple simulated tumors of different sizes. Physicians at each of the sites were able to evaluate the images and identify all tumors.

Based on this initial success, the network is expanding its phantom imaging program by providing other phantoms to qualified sites in the network's registry. A cardiac phantom is being testing at the 4 initial sites, and a brain phantom prototype is being developed and is anticipated to be available this month to assist with site imaging evaluation for an upcoming phase 3 clinical trial. These 3 phantoms will be on display at the MI Gateway in the exhibit hall during SNM's 56th Annual Meeting, June 13–17 in Toronto, Canada. More information about SNM's Clinical Trials Network is available at: www.snm.org/clinicaltrials.

SNM

Cesium Chloride Radiation Security Enhanced

The Nuclear Regulatory Commission (NRC) on April 15 directed agency staff to "continue enhancing the security of cesium chloride radiation sources" while encouraging research and further technological developments for alternative chemical forms of ^{137}Cs. In a paper prepared last November, NRC staff indicated that near-term replacement of cesium chloride sources in existing blood, research,

and calibration irradiators is not practical and would be harmful to the delivery of medical care, research, and emergency response capabilities. "Banning or phasing-out cesium chloride radiation sources at this time—before a replacement form or other technology is available—would be counterproductive, because society would lose the many benefits these sources provide in medicine, industry, and research," said NRC Chair Dale E. Klein.

The NRC noted that security controls already implemented over the past several years have significantly improved the security of these sources. However, it directed staff to continue exploring new ways to improve security. These efforts are to include working with federal and state agencies to define criteria for a "dispersible source of concern" that could then be used to guide research efforts to develop an alternative form of cesium. The staff was also directed to develop an NRC policy statement detailing the Commission's emphasis on security of cesium chloride sources.

These radiation sources fall into the International Atomic Energy Agency Categories 1 and 2, which the NRC considers most sensitive from a security standpoint. These sources are widely used in irradiators to sterilize human blood, in biomedical and industrial research, and for calibration of radiation instrumentation and dosimetry. Concern over security of these sources led to a February 2008 report from the National Academies, *Radiation Source Use and Replacement*, which recommended action to eliminate or replace these sources but also advocated caution in replacing them because of the benefits they provide. The NRC's own Advisory Committee on the Medical Uses of Isotopes has cited cesium chloride's advantages over other available technologies and recommended a continued emphasis on improving security as an alternative to replacement.

Nuclear Regulatory Commission

Education About VQ Scan Benefits

Educating physicians about ventilation–perfusion scanning (VQ) as an alternative to CT for the diagnosis of pulmonary embolisms led to a 23% decrease in patient exposure, according to a study performed at Albert Einstein College of Medicine, Montefiore Medical Center (Bronx, NY) and presented on April 30 at the annual meeting of the American Roentgen Ray Society in Boston, MA.

Collaborative and educational seminars were held between radiology, nuclear medicine, and emergency medicine departments regarding radiation doses and comparable sensitivities of VQ and CT pulmonary angiography for pulmonary emboli. "The proportion of CT to VQ changed dramatically after our seminars," said Linda Haramati, MD, lead author of the study. "In 2006 about 60% of the studies were CT, while in 2007, about 60% were VQ. The researchers found that the mean effective dose was reduced by 23%, from 11.5 mSv in 2006 to 8.9 mSv in 2007. "CT confers a much higher radiation exposure than VQ scans," said Haramati. "However VQ scans are harder to interpret in patients with abnormal chest x-rays, so we, along with our emergency department physicians, have decided to perform VQ scans as the preferred imaging modality in patients with normal chest x-rays who are suspected of having pulmonary embolism in order to decrease radiation exposure."

American Roentgen Ray Society