IAEA and Molecular Nuclear Medicine

From November 10 through 14, almost 400 delegates from 82 countries attended the first International Conference on Clinical PET and Molecular Nuclear Medicine, held in at the Chulabhorn Research Institute in Bangkok, Thailand, and sponsored by the International Atomic Energy Agency (IAEA). The conference focused on the entire spectrum of molecular imaging activities, from scientific and technological developments to training and education challenges in setting up clinical PET services in IAEA member states. Fewer than one-fourth of IAEA member states have such facilities, but many are in the process of planning for clinical PET services and looking to the expertise of more established centers. "With this meeting we are hoping to present member states with the possibility to gain an insight into what is needed to develop and establish a clinical PET service in their countries," said the IAEA's Kishor Solanki, MRPharm, 1 of the scientific secretaries of the conference, before the opening events. The conference was designed to give clinicians, scientists, and other professionals an international perspective on developments in clinical PET and offer an overview of molecular imaging and its uses in oncology, neurology, cardiology, and general medicine.

The IAEA provides extensive support to member states on clinical PET and molecular imaging services, including training for physicians, radiologists, radiopharmacists/chemists, medical physicists, pharmacologists, and other scientists.

Peter Conti, MD, PhD, represented the SNM at the meeting and provided the invited highlights overview at the closing session. Heinrich Schelbert, MD, PhD, editor of *The Journal of Nuclear Medicine*, was among numerous attendees from the United States and presented an invited talk on cardiac metabolism imaging. The proceedings of the conference will be published in 2008, and the conference program can be accessed at www-pub.iaea.org/MTCD/Meetings/PDFplus/2007/cn157/cn157_Programme.pdf.

International Atomic Energy Agency

PET and PET/CT in the UK

In a monograph released in November, Karen Facey, PhD, and colleagues from the United Kingdom and New Zealand reported on a comprehensive survey of UK PET facilities to determine the clinical effectiveness of ^{18}F-FDG PET in breast, colorectal, head and neck, lung, lymphoma, melanoma, esophageal, and thyroid cancers, as well as the effect of PET findings on management decisions. The 290-page study appeared in *Health Technology Assessment* (2007;11), the international journal series of the Health Technology Assessment Programme, part of the National Institute for Health Research in the United Kingdom.

Augmenting data from a previous systematic search, this study focused on major electronic databases, including 6 systematic reviews and 158 primary studies, and the 2006 survey of PET facilities. Studies were limited to those using commercial dedicated PET or PET/CT with ^{18}F-FDG in the 8 targeted cancers.

As expected, both PET and PET/CT were used for a variety of cancer indications, but this use was inconsistent and PET facilities were not distributed evenly across the UK. The authors found major variations in throughput and cost, with a range of per scan costs from £635 to £1,300. An economic model for England indicated that in non–small cell lung cancer (NSCLC), PET imaging was cost effective in CT node-negative patients but not in CT node-positive patients. PET was also found to be cost effective in radiation therapy planning for NSCLC. A model for Scotland indicated that in late-stage Hodgkin's lymphoma (HL), PET was cost effective for restaging after induction therapy. For staging/restaging colorectal cancer, PET changed patient management with significant effects on curative therapy. Management changed with PET in the detection of solitary pulmonary nodules, but the resulting effect on outcomes was unclear. ^{18}F-FDG PET also affected management in pediatric lymphoma.

The authors called for additional research with larger numbers of patients and more consistent methods to augment the evidence base, with an emphasis on national and international collaboration among sites.

Center for the Advancement of Health

SNM Offers Fellowships for Japanese Physicians

SNM announced in early November the introduction of a 2-year, $24,000 fellowship program in the United States for Japanese physicians in the early stages of their careers. "The SNM Wagner–Torizuka Fellowship will advance fellows' research and clinical experience, as well as facilitate professional development, so young Japanese physicians can make significant contributions to the field of molecular imaging and nuclear medicine," said SNM President Alexander J. McEwan, MD. "With this new program, SNM continues its long-time tradition of promoting—and expanding—the discovery of new science and the creation of new techniques and technologies." He added that "SNM is especially grateful to Nihon Medi-Physics, a Japanese diagnostic nuclear medicine firm, and SNM members Henry N. Wagner, Jr., MD, and Kanji Torizuka, MD, PhD, for sponsoring the fellowship." The fellowship was created to encourage Japanese physicians to enhance international research and clinical collaboration with their American colleagues in molecular imaging and nuclear medicine and extend collegial cooperation

between SNM and the Japanese Society of Nuclear Medicine.

"For almost half a century, Japanese physicians and scientists have studied nuclear medicine in the United States. Scores of them founded and now head departments of nuclear medicine and radiology in Japan," said Wagner, professor emeritus of medicine and radiology at the Johns Hopkins Medical Institutions (Baltimore, MD). "This fellowship is a step toward ensuring that this outstanding relationship will continue far into the future of this exciting, new, revolutionary specialty of molecular imaging."

"This program will greatly contribute to the further progress of molecular imaging and nuclear medicine in Japan," said Torizuka, emeritus professor of Kyoto University and Fukui Medical University (Japan). "Young Japanese physicians will have valuable experiences in the United States through this wonderful program. They can then lead the exciting new era of molecular imaging and nuclear medicine in Japan, maintaining collaboration and friendship with colleagues in the United States." Applicants must be permanent residents of Japan and have received their Japanese medical licenses within the past 15 years. To apply online, see www.snm.org/fellowships. Applications are due February 15, 2008. For additional information, contact Nicole Kern, SNM program manager, via e-mail at nkern@snm.org or by phone at 703-652-6795.

Society of Nuclear Medicine

PET to Monitor Immune Response to Melanoma

Scientists at the University of California at Los Angeles (UCLA) Jonsson Comprehensive Cancer Center and at other institutions in Los Angeles announced on November 15 a $1.8 million grant from the W.M. Keck Foundation to fund collaborative research to genetically engineer the human immune system to fight melanoma. The project brings together experts in basic science, tumor immunology, molecular imaging, embryonic stem cell biology, gene medicine, and clinical research from UCLA, the California Institute for Technology, Children's Hospital Los Angeles, and the University of Southern California. Cutting-edge technologies will be used to bolster the immune system through genetic engineering, and PET imaging will provide real-time assessment. "Something like this has never been done before," said James Economou, MD, PhD, deputy director of the Jonsson Cancer Center and the study's principal investigator. "We are writing 1 of the most exciting stories in human biology, the genetic engineering of the human immune system. If we're successful, this can change the way we care for some cancer patients."

According to a press release from the Jonsson Center, the process would work "like a mini stem cell transplant." Blood stem cells that later differentiate into T lymphocytes would be removed from a patient's body and be engineered to target a melanoma antigen (MART1). On transplantation, these lymphocytes would be paired with a reporter gene for PET imaging. Over the ensuing 2–3 months, the cells would develop into a "genetically engineered immune system designed to seek out and kill melanoma cells." "If we could do that, the patients would have plenty of killer T-cells to recognize and kill the cancer," Economou said.

Clinical trials in humans are expected to be launched early next year. "I don't know that it's going to work, but I think the most important thing is that we're set up to understand why it doesn't work if the first few trials are not successful," said Owen Witte, MD, director of the Eli and Edythe Broad Center of Regenerative Medicine and Stem Cell Research at UCLA and the scientist heading up 1 portion of the project. "Using molecular imaging, we should be able to see these cells and locate them in the body. And if 1 or more of those steps doesn't go right, we can go back, change something, and try again. If this idea works, there's really no limitation to the types of cancers one can attack if one can develop the knowledge base about the specific type of antigens expressed in various cancers."

The UCLA Jonsson Comprehensive Cancer Center

Molecular Imaging Funded at Washington University

Washington University School of Medicine (St. Louis, MO) announced on November 8 that its innovative, multidisciplinary molecular imaging center had received a 5-year, $10 million grant from the National Cancer Institute (NCI). The grant will fund a second cycle of research at the Washington University Molecular Imaging Center, where scientists collaborate on advanced imaging projects. Initiatives at the center include an effort to help researchers track the spread of gene therapy for cancer and projects to monitor the contributions of key genes to tumor growth. "A number of research projects from the first grant have led to technology and approaches to imaging that we're now leveraging to answer major biological questions in this second grant," said the center's director, David Piwnica-Worms, MD, PhD, professor of radiology and of molecular biology and pharmacology.

Piwnica-Worms is a coinvestigator on a Molecular Imaging Center project led by John F. DiPersio, MD, PhD, the Lewis T. and Rosalind B. Apple Professor of Medicine. The team has developed a method for incorporating a "suicide gene" into transplanted cells to lessen complications from graft-versus-host (GVH) disease. Whole-body PET is used to track the transplanted cells. "We know from mouse models that there are some different patterns of cell trafficking that seem to predict GVH," Piwnica-Worms said. "Obviously, we can't currently make human treatment decisions based on these kinds of patterns. But we'll be looking for potential correlations with an eye to maybe 1 day determining by PET that GVH is starting even before clinical symptoms become apparent."

In another project, scientists led by Helen Piwnica-Worms, PhD, professor of cell biology and physiology and of medicine, will probe cells' progression through the various stages of their life cycles. Piwnica-Worms and her colleagues are using molecular imaging to better understand how delays in the

processes of replication are created, allowing cells to inspect their own DNA for damage that could lead to cancer.

Raphael Kopan, PhD, professor of molecular biology and pharmacology and of medicine, leads another project that will examine how a protein called Notch contributes to cancer. Kopan's effort will harness 1 of the Molecular Imaging Center's core facilities, which make available technology, equipment, and expertise needed for research. This project will make use of a high-throughput screening core that allows rapid testing of compounds for desirable interactions with a target molecule. Kopan's group wants to identify potential pharmaceutical treatments for cancer.

The center's other core facilities include a chemistry core that develops optical probes and imaging agents for new biological targets and a molecular imaging reporter core that contains tools for genetically altering cells and animals to enable tracking of molecules of interest. "It's an NCI-funded program, so our core focus is cancer, but the center's resources also support collaborative imaging efforts in a wide variety of fields, including immunology, neuroscience and cardiovascular disease," added David Piwnica-Worms. In addition to research activities, the center's new grant includes funding for support of postdoctoral and graduate students.

Washington University School of Medicine

HRSA Provider–Patient Communication Tool

The Health Research Services Administration (HRSA) announced on November 21 the launch of a new Web-based health communications training tool designed to improve interaction between health care providers and their patients. The interactive training course, "Unified Health Communication: Addressing Health Literacy, Cultural Competency, and Limited English Proficiency," is designed to raise the quality of provider–patient interactions by teaching providers and their staffs how to gauge and respond to patients' health literacy, cultural background, and language skills. The course was previewed at the 2007 annual meeting of the American Public Health Association in Washington, DC, in early November.

The course's 5 modules take 4–5 hours to complete. Modules 1 through 4 provide an introduction to health communication, health literacy, cultural competency, and limited English proficiency. In Module 5, participants apply information learned in previous modules to test their ability to communicate effectively with patients. The modules' textual information is enhanced by colorful graphics, interactive elements, and video vignettes.

Continuing education credits for completing the course are being made available from the American Academy of Physician Assistants, the American Association for Health Education, the American Pharmacists Association, and the National Committee for Quality Assurance. Users may choose to take the course with or without continuing education credits. For more information, see www.hrsa.gov/healthliteracy/training.htm.

Health Research Services Administration

FDA Advisory Committee Process Changes

The Food and Drug Administration (FDA) announced on November 15 steps to strengthen its advisory committee processes in response to recent recommendations from the Institute of Medicine. The measures include proposed new guidance or procedures on advisory committee voting, on disclosing information on conflicts of interest, and on security and appropriate conduct for participants at meetings. Other improvements include greater clarity for material posted on the FDA's advisory committee Web site (www.fda.gov/oc/advisory/default.htm). "One of FDA's strengths is that we routinely enlist the nation's leading experts to give us public advice on complex medical and scientific issues," said Randall Lutter, PhD, FDA deputy commissioner for policy. "The new steps we're taking further enhance the transparency and reliability of our advisory committee processes."

A draft guidance document recommends that advisory committees adhere to a process of simultaneous voting in which all members vote at once and results are announced immediately. The votes of each member would be part of the public record. This draft guidance document is available at www.fda.gov/oc/advisory/votingguidance.html. A second draft guidance lays out recommended changes to the process of public disclosure of financial interests that create conflicts of interest and requires that all advisory committee members publicly disclose interests for which a waiver is granted. Redesigned disclosure and waiver templates are also provided. This draft guidance document is available at www.fda.gov/oc/advisory/waiver/ACdisclosure1007.html.

FDA also has formalized operating procedures designed to ensure appropriate security and appropriate decorum at advisory committee meetings. In addition, the FDA has changed its Web page on advisory committees by providing better access to information about waivers granted for conflicts of interest. This Web page provides current information about upcoming advisory committee meetings and other updated information related to the FDA's advisory committee processes. On the site, the FDA has posted the names of outside experts appointed to a new risk communication advisory committee to make recommendations about how best to communicate the risks and benefits of FDA-regulated products.

FDA's policies on advisory committees continue to be informed by new studies on conflicts of interest. The agency asked a consultant, Eastern Research Group, to study 16 recent advisory committees. The report highlighted the difficulty of assembling highly qualified experts who are free of conflicts and found that those who had received waivers appeared to be significantly more qualified than those who had not. The full report is available at www.fda.gov/oc/advisory/ERGCOIreport.pdf.

U.S. Food and Drug Administration

ABMS Launches Certification PSA

The American Board of Medical Specialties (ABMS) announced on November 23 the launch of a television public service announcement (PSA) campaign to educate Americans about the significance of physician board certification as a credential to consider when selecting a physician. The "Certification Matters: How to Choose a Doctor " PSA is being distributed as part of the "Spotlight On " series on national public television. The 5-minute program is directed toward patient consumers, encouraging research in selecting a physician. "While the specialization of medicine has brought better, more precise care, patients can often get overwhelmed when they need to choose a new health care provider," explained Stephen H. Miller, MD, MPH, president and CEO of ABMS. "We hope that this segment encourages viewers to take an active part in who administers their care by becoming educated about the importance of board certification."

The PSA is also available on the ABMS Web site (www.abms.org), along with additional information about board certification and physician specialties. Members of the public can determine the certification status of a doctor by clicking on the "Is Your Doctor Certified?" link. The PSA is part of an ongoing campaign by the ABMS to educate the public on the purpose and value of certification. The PSA can be viewed at www.trivue.org/All_Movies/Doctors.html.

American Board of Medical Specialties

(Continued from page 23N)

systems are complemented by the use of NIR-based imaging reagents designed to exploit the tissue transparency window (700–900 nm). These developments have improved the sensitivity of fluorescence imaging in vivo. Finally, the reduced cost of purchasing, using, and maintaining hardware for optical imaging (which is devoid of the constraints imposed by radioactivity) is attractive for small and large imaging centers alike.

As part of a new series called Focus on MI, this issue of *The Journal of Nuclear Medicine* features a review article from Kathryn Luker, PhD, and Gary Luker, MD (see page 1), summarizing the current state of optical imaging. This article should fascinate anyone with an interest in the future of molecular imaging in the practice of medicine.

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(Continued from page 23N)

who have multiple certifications. Although board members are not paid, they donate several weeks of their time each year to the ABNM and its diplomates. The only source of income for certifying boards is their diplomates. Because MOC will benefit all diplomates, the ABNM has developed policies to equitably distribute the cost of MOC among all of its diplomates.

The ABNM and SNM are independent organizations with many common interests. The ABNM establishes the requirements for certification and MOC but relies on other organizations, such as SNM, to provide the products (e.g., CME and self-assessment modules) to meet these requirements. The organizations providing these products independently establish their costs.

Henry D. Royal, MD
Executive Director, ABNM