

Symposium Focuses on Future of Neuroimaging

On May 6 and 7 the SNM Molecular Imaging Center of Excellence (MICoE) hosted a conference—cosponsored by the Radiological Society of North America, the Society of Radiopharmaceutical Sciences (SRS), and the Society for Molecular Imaging (SMI)—designed to bring together the many disparate but mutual interests of the broad neuroimaging community. The 2-d symposium hosted individuals from multiple scientific disciplines—including chemistry, engineering, physics, molecular biology, neurosciences and imaging sciences—to promote the emerging field of molecular neuroimaging.

“Molecular Imaging Symposium: Envisioning the Future of Neuroscience” was held at the Natcher Auditorium on the National Institutes of Health (NIH) campus in Bethesda, MD, and attracted physicians and researchers from the basic science, translational, and clinical communities, including a number of scientists in training. The symposium focused on advances in targeted multimodality imaging of the central nervous system (CNS), including imaging of the blood–brain barrier, tumors, neuroreceptors, stem cells, adoptive immunotherapies, and other biological processes relevant to the CNS. The meeting was supported by grants from the National Institute of Biomedical Imaging and Bioengineering (NIBIB) and the National Institute of Neurological Disorders and Stroke (NINDS).

“This field has evolved from many different disciplines,” said Michelle S. Bradbury, PhD, MD, of the Sloan-Kettering Institute for Cancer Research (New York, NY) and cochair of the program committee, “so we tried to plan a program that included a variety of new brain imaging technologies, translational nano-molecular probes/sensors, cellular-based gene/drug delivery vehicles, as well as fundamental concepts defining blood brain barrier function. The linking of these very diverse fields might then serve as a catalyst to create a more cohesive subspecialty.”

Day 1: Overview of a Rapidly Evolving Field

The May 6 keynote speech was delivered by William Partridge, MD, from the University of California, Los Angeles. Partridge discussed the design and engineering of molecular “Trojan horses” as a way to smuggle biopharmaceuticals through the blood–brain barrier.

The speech was followed by the first of 4 sessions for the day, each of which began with a lecture and concluded with a panel discussion and question-and-answer session. The first session, “Molecular Imaging Techniques: Intraoperative and Preclinical Imaging Applications,” was moderated by Benjamin Tsui, PhD (Johns Hopkins



Herscovitch presents Sirianni with the first place abstract award for her work on a noninvasive imaging technique designed to measure the distribution of drugs in the brain.

University; Baltimore, MD) and provided an overview and introduction to current molecular neuroimaging. Session 2 focused on “Nanotechnology for CNS Diagnostics/Therapeutics” and was moderated by Gabriel Silva, PhD (University of California, San Diego). A lunchtime keynote address by Nora Volkow, MD, director of the National Institute on Drug Abuse (Bethesda, MD) explored “Imaging the Addicted Brain.” Session 3 was moderated by David Piwnica-Worms, MD, PhD (Johns Hopkins Hospital; Baltimore, MD) and covered “Overcoming the Blood–Brain Barrier: Imaging Agent Delivery



Ten students sponsored by Young Investigator Travel Awards presented abstracts on their work at the meeting. From left, Das, Kumar, Sirianni, Alkonyi, Sheldon, Dosa, Park, Yang, Yu, and Zhou.

to the CNS.” The day’s final session, moderated by Bradbury, was on “Stem Cell Therapeutics and Adoptive Immunotherapies of Brain Tumors.”

In addition to a reception, the evening’s activities included an awards banquet, featuring a keynote address from Michael Phelps, PhD (University of California, Los Angeles) on “Translating Metabolic Assays into Molecular Imaging Diagnostics.”

Day 2: The Neuroimaging Community’s Future

Sessions and activities on day 2 of the symposium looked at new information on imaging brain tumors, imaging biomarkers for the diagnosis of dementia, and related psychiatric and neurobehavioral research. Dima Hammoud, MD, of the Clinical Center/NIH, and, with Bradbury, cochair of the symposium’s program committee, opened the day’s session by welcoming attendees and presenters and stressing the effort to build a community of interest in neuroimaging: “We hope that by bringing together researchers and clinicians working in the field of molecular neuroimaging, we have stimulated interaction among speakers and attendees, fostered collaboration, and promoted the rapid advancement of this emerging field,” she said.

“Our aim for this meeting is to bring the clinical and research communities together,” added MICOE President Henry F. VanBrocklin, PhD, professor of radiology and director of radiopharmaceutical research in the Center for Functional and Molecular Imaging at the University of California, San Francisco. “Translating basic research into clinical techniques is a long and arduous task that requires input from both sides and constant communication between the people designing the scanners and probes and those who will eventually use them to improve the clinical care of patients.”

The day began with a keynote presentation on “Strategies to Overcome the Blood–Brain Barrier for Treatment of Brain Tumors” from Edward Neuwelt, MD (Oregon Health and Science University; Portland). The session that followed was moderated by Keith Thulborn, MD, PhD (University of Illinois; Chicago) and focused on “Molecular Imaging Advances in the Evaluation of Primary Brain Tumors.” A session on “Imaging Biomarkers for Detection and Monitoring Progression of Neurodegenerative Disorders/Dementia,” was moderated by Peter Herscovitch, MD, SNM Scientific Program Chair. In the afternoon, Hammoud moderated a session on “Neuroimaging Abnormalities in Early Onset Mood Disorders.” Jeffery Petrella, MD (Duke University Medical Center; Durham, NC) delivered a final keynote address titled “From Molecules to Networks to Behavior.”

Encouraging Next-Generation Researchers

Organizers of the meeting made special efforts to reach out to young researchers with interests in the field. In an evolving and multidisciplinary area such as molecular neuroimaging, the engagement of next-generation researchers is especially important. The sponsoring organi-

zations offered travel awards to 10 outstanding young investigators who submitted abstracts on their work. The SNM MICOE provided travel grants to Edit Dósa, MD, from the Oregon Health and Science University (Portland), for “Magnetic Resonance Imaging of Intracranial Tumors: Intra-Patient Comparison of Gadoteridol and Ferumoxytol”; and Forrest C. Sheldon, BS, Duke University Medical Center (Durham, NC), for “Disruption of Functional Brain Connections in Alzheimer’s Disease.” The SRS sponsored travel by Bhaskar C. Das, PhD, from the Albert Einstein College of Medicine (Bronx, NY) for “Design and Synthesis of Boron-Containing Retinoids as New Therapeutic and Diagnostic Agent for Brain Cancer Glioblastoma Multiforme (GBM)”; Eunkyung (Angela) Park, MD, PhD, from Korea University College of Medicine (Seoul) for “Differential Diagnosis of Parkinson’s Disease and Drug-Induced Parkinsonism Using ^{18}F -FP-CIT PET/CT”; Rachael W. Sirianni, PhD, from Yale School of Medicine (New Haven, CT) for “Development of dPET, A Non-invasive Imaging Technique to Measure the Distribution of Drugs After Direct Delivery to the Brain”; Yang Yang, from Beijing Normal University (People’s Republic of China) for “Novel Imaging Agents for β -Amyloid Plaques Based on the 5-(2-Phenylethenyl)-1H-Indole Core”; and Lihai Yu, also from Beijing Normal University, for “Novel Indole and Pyrole Derivatives as Potential ^{11}C -Labeled Radiotracer for Imaging β -Amyloid Plaques in AD Brain.” The SMI sponsored travel by Balint Alkonyi, MD, from Wayne State University (Detroit, MI) for “Increased L-[1- ^{11}C]Leucine Uptake in the Angioma Associated with Cortical Hypometabolism in Children with Sturge-Weber Syndrome: a PET Study”; Ajay Kumar, MD, PhD, also from Wayne State University School of Medicine, for “Evaluation of Neuroinflammation in Children with Niemann Pick Disease Type-C Using ^{11}C PK-11195 PET”; and Heling Zhou, BS, from The University of Texas Southwestern Medical Center (Dallas) for “In Vivo Imaging of Tumor Hypoxia and Vasculature of Orthotopic Mouse Brain Tumor Models.”

Each young investigator presented his or her work to a panel of judges at a poster session and reception on May 6. At the award ceremony and dinner that evening, a first-place merit award went to Sirianni, second place to Sheldon, and third place to Dósa. Sheldon told Newsline, “I’m a young researcher just squeaking by, so the travel award really made it possible for me to come. It was great to meet researchers from so many disciplines. I had no idea how broad the field of molecular imaging was before I came here. The chemical aspects of PET probes really piqued my interest.”

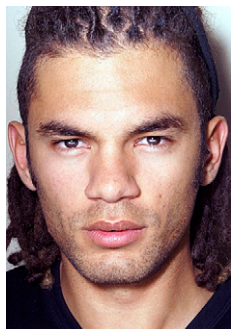
Building on a New Foundation

A number of follow-ons are planned as a result of the symposium. Powerpoint presentations and video recordings of most sessions are available at www.molecularimagingcenter.org (>MI Resources > Meetings and Workshops: Enduring Materials). A special issue of *Molecular Imaging* in 2011 will

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Outstanding *JNMT* Articles for 2009

Frances Neagley, CNMT, FSNMTS, editor-in-chief of the *Journal of Nuclear Medicine Technology (JNMT)*, presented awards at the 2010 SNM Annual Meeting to the authors of 3 articles chosen as the most outstanding 2009 *JNMT* contributions. The lead authors or their representatives



Tezontl Rosario

received plaques and honoraria in a ceremony held during the annual business meeting of the SNMTS on June 8 in Salt Lake City, UT. Tezontl Rosario, Michel C. Öllers, Geert Bosmans, Dirk De Ruysscher, Philippe Lambin, and Andre Dekker, from the Catharina Hospital (Eindhoven, The Netherlands), received the first-place award for “Phased versus mid-ventilation attenuation-corrected respiration-correlated PET for patients with non-small cell lung cancer (*J Nucl Med Technol.* 2009;37:208–214). The second place award went to Danny Basso, Gregory Passmore, Michael Holman, Ward Rogers, Leslie Walters, Thomas Zecchin, and Jayme Butler, from Cardiac Imaging of Augusta (GA), for “Semiqualitative visual and quantitative morphometric evaluations of reduced scan time and wide-beam reconstruction in rest-

gated stress SPECT myocardial perfusion imaging.” (*J Nucl Med Technol.* 2009;37:233–239). The third place award was presented to Norman E. Bolus, Remo George, Johnneé Washington, and Bradley R. Newcomer, from the University of Alabama at Birmingham, for “PET/MRI: The blended-modality choice of the future?” (*J Nucl Med Technol.* 2009;37:63–71).

“These papers represent the broad range of investigative endeavors—across the spectrum of clinical, radiopharmaceutical, technological, and basic sciences—in which nuclear medicine technologists are involved today,” said Neagley. “We congratulate this year’s awardees and all those whose contributions continue to make *JNMT* a vital resource that is constantly evolving to meet the changing scientific and professional needs of our readers.” ✧



Danny Basso



Norman E. Bolus

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feature articles drawn from a number of presentations at the symposium. Together with last year’s Multimodality Cardiovascular Molecular Imaging seminar and a planned 2011 symposium on breast cancer imaging and therapy, this symposium is part of a molecular imaging translation series that SNM and the MICoE hope to continue into the future.

“Recruitment of basic neuroscientists and subspecialists in the context of a symposium, such as this one, can critically shape future advances in molecular neuroimaging,” said Bradbury. “The feedback from attendees and from the NIBIB is that this evolving field would significantly benefit from

periodically organizing this same event every 2–3 y, bringing in a broader array of speakers who can continue to help expand the field in new directions and create a more cohesive neuroimaging community. Defining the science of imaging at multiple scales—at the organ, cellular, and genomic/proteomic levels—will be fundamental to extending this exciting translational field into the future and accelerating arrival at our ultimate goals: improving patient management and individualizing patient care.”

Ann Coleman
SNM Molecular Imaging Center of Excellence