

NIH Participation at WMIC Exemplifies Growing Interest in Imaging Biomarkers

SAVANNAH, Ga., Sept 19, 2013 /PRNewswire-USNewswire/ -- Diagnosing diseases, such as cancer, heart disease and Alzheimer's, at their earliest stages and monitoring the earliest responses to therapy, requires careful detection of molecular biomarkers. Significant advances in the development of non-invasive imaging methods to detect molecular biomarkers were highlighted in science presented this week at the World Molecular Imaging Congress (WMIC) 2013 in Savannah, GA.

"The number of studies demonstrating significant advances in the development of imaging biomarkers for the detection of various cancers, heart disease, Alzheimer's and other diseases are one of the highlights of this year's World Molecular Imaging Congress. The increase in the number of imaging biomarker studies parallels the growth in clinical trials for assessing the value of these imaging biomarkers. The active participation from the NIH and the FDA at the WMIC and the tremendous innovation in molecular imaging we are experiencing continue to demonstrate the very strong interest in translating imaging biomarkers to the clinic in the near future," said Zaver Bhujwalla, Ph.D., WMIS President, and Professor, Radiology & Radiological Science, Oncology; Johns Hopkins University School of Medicine.

Using a multi-modality imaging approach, Dr. Bernd Pichler and colleagues at the University of Tübingen, Germany, detected an important protein biomarker that is related to reduced brain perfusion during the progression of Alzheimer's Disease, which may lead to earlier detection and monitoring of disease progression. Results of the study, "Multiparametrical PET/MRI reveals that both β -amyloid load and loss of perfusion in the brain of transgenic AD mice reach a plateau phase," add crucial understanding of disease progression and growth that may improve the ability to identify ideal therapeutic windows for amyloid targeting therapies.

One of the goals of molecular imaging in oncology is to develop imaging probes that target the tumor with high sensitivity and specificity. The discovery of bona fide cell-surface markers for lung cancer is a key initial step in the development of lung cancer specific molecular imaging probes. Fluorescently-labeled targeted probes can be developed for real-time surgical guidance. In the study "Molecular Imaging of Lung Cancer using a Fluorescent δ -Opioid Receptor Targeted Probe: Pharmacokinetics, Biodistribution, and Intraoperative Guidance," Dr. David Morse

and colleagues at the Moffitt Cancer Center, Tampa, FL.

, presented findings about the detection of cell-surface protein biomarkers in lung tumors using optical imaging techniques. The fluorescent "Dmt-Tic" probes demonstrated high selectivity and affinity for the δ -Opioid Receptor, which should enable the use of these probes for guidance during lung cancer resection.

As another example of the many oncology biomarkers presented at the WMIC, protein biomarkers that stimulate the growth of breast tumors have been detected using ultrasound imaging by Dr. Juergen Willman and collaborators at Stanford University in the study "Improved Diagnostic Accuracy of Ultrasound for Early Breast Cancer Detection using VEGFR2-targeted Contrast Microbubbles in a Transgenic Mouse Model." Results suggest that VEGFR2-targeted ultrasound molecular imaging allows highly accurate and reliable detection of DCIS (also known as ductal carcinoma in situ or intraductal carcinoma), the most common type of noninvasive breast cancer in a transgenic mouse model. Imaging tumor angiogenesis on a molecular level using ultrasound molecular imaging may be a promising approach for earlier detection and improved characterization of breast cancer in future clinical trials.

The use of nano-particles from drug delivery is well established in oncology, however, there is limited data on the use in atherosclerotic plaque. In the study, "Nanoparticle targeting mechanism in experimental atherosclerosis," Dr. Zahi Fayad and collaborators at Mount Sinai School of Medicine investigated the use of a novel nano-sized iron particle to target a protein biomarker in atherosclerotic plaque deposits in blood vessels, which could improve the ability to detect and diagnose the disease before the plaque can rupture and cause a heart attack. Results demonstrated uptake in atherosclerosis is very similar to targeting in cancer, suggesting that nano-particles may also be effective for drug delivery to atherosclerotic plaques. Results also demonstrated that 3D contrast-enhanced MRI can be used to detect these nanoparticles in the plaques.

"Proteins are the machines that perform almost all functions within the body, including tumors. Detecting protein biomarkers, the key cogs within the protein machinery, can lead to earlier diagnoses of heart disease, cancer and other conditions and provide outstanding targets for therapies. The significant advances in imaging molecular biomarkers being presented at this

year's World Molecular Imaging Congress, demonstrate the progress towards early disease diagnoses that will impact health care," said Marty Pagel, PhD of the University of Arizona Cancer Center.

This year's World Molecular Imaging Congress program consisted of 168 oral presentations and 35 spotlight presentations emphasizing five categories: Chemistry & Imaging Probes, First-in-Human & Clinical Studies, Preclinical Cell & Tissue Level Studies, Preclinical *in vivo* Studies, Technology & Software development, with over 60 top Industry Exhibitors. Visit www.wmicmeeting.org

ABOUT WORLD MOLECULAR IMAGING SOCIETY The WMIS is dedicated to developing and promoting translational research through multimodal molecular imaging. The education and abstract-driven WMIC annual meeting is held in conjunction with European Society for Molecular Imaging (ESMI) and Federation of Asian Societies for Molecular Imaging (FASMI). WMIC is the only meeting that provides a unique platform for scientists and clinicians with very diverse backgrounds to interact, present, and follow cutting-edge advances in molecular imaging. Industry exhibits at the congress include the latest advances in preclinical and clinical imaging applications creating a complete molecular imaging educational technology showcase.

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