AbstractID: 6029 Title: Molecular Imaging II - Applications

Day two of the Molecular Imaging Symposium (MI-2) will focus on the applications of molecular imaging in small animals and humans. The session will begin with a discussion of a recent trans-agency announcement that addresses molecular imaging as a biomarker for drug response (DHHS *New Federal Health Initiative to Improve Cancer Therapy*). Opportunities for imaging physicists to engage in the development of physical performance standards for dual modality imaging platforms (anatomical and molecular imaging) during the course of therapy treatment will be discussed. Similarly the development of standardized methods to evaluate change analysis tools will be addressed. A case for creation of a new AAPM task group to address this topic will be presented. The following links are of interest:

http://www.fda.gov/oc/mous/domestic/FDA-NCI-CMS.html

http://www.nist.gov/public_affairs/factsheet/bioimaging.htm
http://imaging.nci.nih.gov/i3/

The second lecture will review the clinical research use of existing contrast agents in dynamic contrast MRI for early assessment of therapy-induced microvascular changes, pre-clinical use of novel high molecular weight and/or targeted or enzymatically activated MR contrast agents, endogenous contrast agent techniques, such a blood oxygen level dependent (BOLD), for assessing changes in tissue oxygenation, and other techniques for assessing treatment response or improving lesion characterization, including quantitative diffusion and spectroscopy techniques.

The session will conclude with an introduction of the new combined modality instrumentation now available in PET/CT and SPECT/CT, discuss clinical examples of radiotracers that are being used in oncologic imaging (FDG, amino acids, peptide, hormones, antibodies, cell proliferation and hypoxia tracers), techniques to evaluate whether radiotracers actually localize at the intended site (i.e., autoradiographic correlation with tumor immunohistochemistry in rodent models and on clinical biopsy tissue), and the use of functional images to determine features of tumor biology, to monitor treatment response, and for radiotherapy treatment planning.