

Medical Physics Seminar

Monday, December 4th, 2017
1335 HSLC ~ 4:00 P.M.

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Magnetic Resonance Spectroscopic Imaging in Cancer and Lung Disease

Specific examples of molecular imaging are well established in clinical nuclear imaging such as FDG-PET for cancer screening, but molecular imaging methods are still in development for MRI despite the modality's inherent spectroscopic capability. Multi-nuclear contrast agents that exploit physical methods for hyperpolarization (^{13}C , ^3He , ^{129}Xe) or inherently high atomic natural abundance (^{19}F perfluorocarbons - PFC) can be used to enhance biological signals in vivo on MRI. Fast spectroscopic imaging methods using these multi-nuclear agents allow visualization and measurement of cellular, physiologic, and metabolic activity in vivo not accessible through other methods. This talk will discuss the framework for, and recent advances in, applications using these contrast agents in pre-clinical and clinical research settings, including: 1) hyperpolarized ^{13}C pyruvate for visualizing cellular products of glycolysis (lactate, alanine, and bicarbonate) to provide insight into shifts in cancer; 2) hyperpolarized isotopes of noble gases, helium and xenon, to study obstructive and restrictive lung disease; and 3) PFC contrast agents for monitoring of cell-based immunotherapy and as a possible means of visualizing cell trafficking and behavior in vivo.

1335 Health Sciences Learning Center (HSLC) 4:00 - 5:00 P.M.