

Graduate Student Seminar

Diffusion Measurements of Hyperpolarized ^3He Gas

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A nine-institution Bioengineering Research Partnership has begun to develop biologically based computational models of the respiratory tract of rats, mice, and humans. The development of these technologies will aid in future research on respiratory disease and the functional impacts of chemical or biological insults, or inhaled drugs. One of the main roles for the Saam group in this effort is the application of Nuclear Magnetic Resonance (NMR) and Magnetic Resonance Imaging (MRI) using hyperpolarized (HP) ^3He gas as a means to determine airway geometries, airflow dynamics, and pulmonary mechanics. Our contributions thus far include pilot studies that use ^3He NMR to measure the apparent diffusion coefficient (ADC) of the gas and thus infer the size and connectivity of regular diffusion-restricted geometries. We intend eventually to apply these techniques to rodent lungs in order to characterize airway architecture. In this seminar we will discuss the creation of HP ^3He gas and the results of our initial diffusion measurements in a polyurethane sponge (a model of the lung).

Tuesday, October 4, 2005

Noon in JFB 334

Pizza will be served!