

Medical Physics Seminar

Monday, October 23rd, 2017

1309 HSLC ~ 4:00 P.M.



Benjamin Cox

Student of Sean Fain, PhD

Research Assistant

Department of
Medical Physics,

UW-School of Medicine
& Public Health



Mariajose Bedoya

Student of Christopher Brace, PhD

Research Assistant

Department of
Medical Physics,

UW-School of Medicine
& Public Health

Bioreactor Development for Multi-Scale Measurement of Tumor Metabolism

The design and fabrication of a novel bioreactor capable of facilitating both magnetic resonance spectroscopy (MRS) and optical fluorescence microscopy is described. Fluorescence lifetime imaging (FLIM) of nicotinamide adenine dinucleotide (NADH) and hyperpolarized [$1-^{13}\text{C}$] pyruvic acid (PA) MRS of a mouse breast cancer line in a 3D collagen matrix is demonstrated. In particular, the effect of glucose-starvation is examined as a proof of principle application. The system provides a novel test-bed for simulating cell-matrix and cell-cell interactions in a 3D microenvironment for investigating multi-scale cellular metabolism in vitro.

Finite-Element Model of Multiple Antenna Microwave Ablation: Impact of High-Power Modulation

Microwave ablation is a minimally invasive percutaneous treatment for liver malignancies. Compared to other ablation modalities, microwaves create faster heating, larger and more consistent ablations. However, local tumor progression still remains a challenge in microwave ablation procedures. Improvement in high-power delivery techniques with single and multiple antenna application may create larger ablation zones to improve local control. This talk will present the results and validation of high power modulation using a finite-element model of microwave ablation compared to continuous power delivery using multiple antenna applicators.

1309 Health Sciences Learning Center (HSLC) 4:00 - 5:00 P.M.