

Bankhead-Coley Cancer Research Program

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*Radiation Oncology
University of Miami*

*2011 Program
New Investigator Research
(3-year project)*

Project Title: Metabolic Tumor Volumes in Radiation Treatment of Brain Tumors

Project Summary: Proton Magnetic Resonance Spectroscopy (MRS) can be used as a non-invasive tool for accurate delineation of tumor and healthy tissue in Radiation Therapy (RT) of patients with brain cancer. Currently, Magnetic Resonance Imaging (MRI) and Computerized Tomography (CT) are used to determine the treatment volumes for radiation dose distribution. Often MRI and CT are ambiguous with regard to tumor volume and tissue viability, while MRS can provide the exact position and extent of tumor infiltration; define the tumor margin and potentially identify the areas of microscopic disease. The University of Miami (UM) has a unique infrastructure for brain imaging – a high magnetic field MRI instrument and sophisticated acquisition and analysis methods which allow for detailed volumetric metabolite data over the entire brain. In this grant we propose to utilize these invaluable resources and apply MRS for brain tumor patient management. The goal is to provide the radiation oncologists with detailed maps of tumor-involved areas. The aberrant distribution of the metabolites will be detected in comparison with a database of information from healthy controls. UM is in the unique position to evaluate the role of MRS in reshaping treatment areas. A potential outcome of the proposed study will be a more precise radiation dose delivery to the malignant tissue, thus improving treatment efficacy. In addition, by minimizing the involvement of normal brain, the treatment will also reduce morbidity.