

1106-VL-2464 **Geena Ildefonso*** (geena.ildefonso@ucf.edu), 4750 Fiske Circle, Orlando, FL 32826. *Cancer Lineages and Radiotherapy*. Preliminary report.

In recent years, studies have shown that only small subpopulations of tumor cells are responsible for the relentless growth of tumors. These cells are known as cancer stem cells (CSC). Here, we propose to investigate the use of radiotherapy in cancer treatment of heterogeneous tumors containing stem and non-stem cells. A featured approach is the incorporation of feedback processes regulating cell behavior. We develop a mathematical model of the cell dynamics using differential equations and the linear-quadratic model to estimate the survival of cells to radiation exposure. To simulate spatial effects, we also plan to use the Cellular-Potts model in which individual cells are represented as a collection of pixels and the dynamics are governed through an algorithm that is based on an energy that also takes into account adhesion, motility, and cell stiffness. To parameterize the models, we will use data from brain tumors provided by the laboratory of F. Pajonk (UCLA). The goal is to develop tumor-specific therapy schedules and dosages to optimize response of tumors to radiation treatment. This is an important step towards developing individualized therapy protocols where therapy is designed to optimize response for patient-specific tumor cells. (Received September 16, 2014)