

TITLE: Modeling pulmonary radiation effects in breast cancer patients and correlating with clinical manifestations of pulmonary dysfunction and QOL.

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Radiation Oncology

RESEARCH PROJECT DESCRIPTION (brief overview of background, hypothesis, methods, role of medical student, funding and relevant publications -- SHOULD NOT EXCEED ~ 250 WORDS)

Our lab focuses on novel imaging and image-based analysis in cancer research, with emphasis on radiation treatment efficacy of reducing harmful side-effects. We have a new 5-year grant to collect repeat chest CT images, blood draws, and pulmonary function tests in breast cancer patients who receive either X-ray based or proton-based treatment of the chest wall as part of their cancer treatment. The objective is to quantify markers of pulmonary toxicity as radiation pneumonitis, fibrosis and changes in vascular anatomy and correlate these with patient specific factors such as smoking history and age, and blood markers of inflammatory response. These will be compared with clinical metrics of pulmonary dysfunction and toxicity to ultimately create a mathematical model to predict a patient's specific risk for developing symptomatic radiation lung toxicity. This study is being done in collaboration with Dr. Julie Bradley at the UF Proton Therapy Institute and involves both patients treated with X-ray-based RT at UF, and patients at the UF PTI.

In addition, we have clinical data and chest images of over 100 patients with lung cancer treated at the UF PTI, in collaboration with Dr. Brad Hoppe. We intend to correlate the same image-based markers as above with clinical lung toxicity in these patients to better document and understand the nature of proton-therapy related lung late effects.

Our lab web site is a good resource for the kind of work we are doing:
<http://odell.radonc.med.ufl.edu/MIACALab/>